

HITCHCOCK'S *Machine Tools* BLUE BOOK

FOUNDED

NOVEMBER 1937

19

"THE MODERN PRECISION BENCH LATHE UN

Catarael



HARDINGE PRECISION PRELOADED BALL BEARING BENCH LATHE UN
COMBINING

NEW DEPARTURE TRANSITORQ DRIVE WITH

HARDINGE TWO-SPEED MOTOR PRINCIPLE

EVERY DESIRED SPEED UP TO 3000 R.P.M. WITH RAPID SPEED CHANGE

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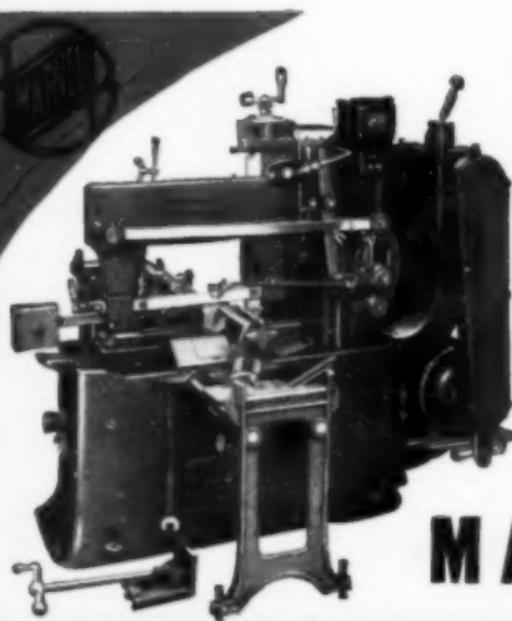
PRECISION BENCH LATHES. HAND SCREW MACHINES. MILLING MACH

HARDINGE BROTHERS, INC., ELMIRA, N.Y.

CHICAGO - NEW YORK - PHILADELPHIA - DETROIT - HARTFORD

Precision Machine Tools Since 1890

PUBLISHED AT 508 SO. DEARBORN ST., CHICAGO



automatic
production
SAWING
at
Ball
Bearing
Speed

MARVEL

Cutting-off in a lathe has always been a slow and costly operation, hard on tools and wasteful of stock. With today's automatic, high-speed MARVEL Saws it has become an easy, fast operation, especially when cutting quantities of identical pieces from bar stock. Requiring no more attention than an automatic screw machine (*Saving labor*), the new MARVEL Nos. 6A and 9A Production Saws will feed to length and cut-off diameters up to 10 inches at the rate of 10 pieces of 6 inches round or 160 pieces of $1\frac{1}{2}$ inches round every hour floor to floor (*Saving time*). With unbreakable High-Speed Edge Hack Saw Blades that are but a fraction of the width of a cutting-off blade, chip loss between pieces is materially reduced and the number of pieces per bar increased (*Saving stock*).

Built by MARVEL, the pioneer builders of automatic bar push-up machines, and strictly heavy-duty with full ball bearing construction, these saws have solved completely the "cutting-off problem".

Send Company for free catalog.

Armstrong Blum Mfg. Co.
"The Hack Saw People"
5841 Bloomingdale Ave.
Chicago, U. S. A.



"Sheffield Gages" just off the press, gives you a complete picture of the modern precision gage and the way it is used in industry today. • It

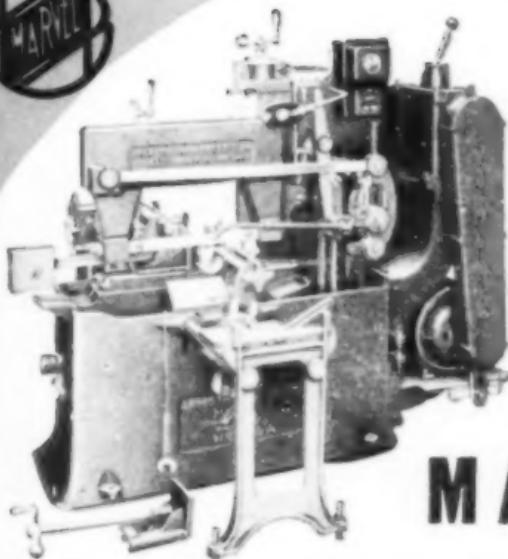
178 illustrations, much tabular and explanatory information on the characteristics and applications of gages. • If you are concerned with gaging or the inspection of precision products, write for "Sheffield Gages" on your own company's letterhead. Your obligation on your part, of course. Requests for this book will be filled in the order in which they are received. To save time, use Quickmail Coupon No. 37.

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GAGE MAKERS



SHEFFIELD GAGE CORPORATION

1517 EAST THIRD STREET, Dayton, Ohio, U.S.A.



*automatic
production*
SAWING
at
**Ball
Bearing
Speed**

MARVEL

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**FURNAS
DRUM
SWITCHES**
**FOR
REVERSING
AND TWO SPEED
MOTORS**

1 TO 5 H. P., 220 TO 440 VOLTS

Compact, sturdy, dependable controls for lathes, milling machines, drill presses, hoists, mixing machines, etc.—for use wherever motors are to be reversed or speed is to be changed. Readily adaptable to a wide variety of switching combinations. Terminals on every model are readily accessible for wiring. Standard creeping and arcing distances have been maintained. All parts are securely locked so there is no chance of parts loosening or shifting in operation.

*Fifty different styles in stock.
Quickmail Coupon No. 84 will bring
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COMBINATION TAP AND DRILL GRINDER



Grand Rapids
Combination
Tap and Drill
Grinder
No. 10-B
Motor Driven
4 Styles

This Grand Rapids Grinder does the work of two machines. It is rugged and fast enough for production grinding occupies very little floor space, and is inexpensive to buy. Capacity, Drills: $\frac{1}{8}$ to $1\frac{1}{2}$. Capacity, Taps: No. 6 to $1\frac{1}{2}$.

Get Rid of your Tap Troubles ... and most of your TAP COSTS

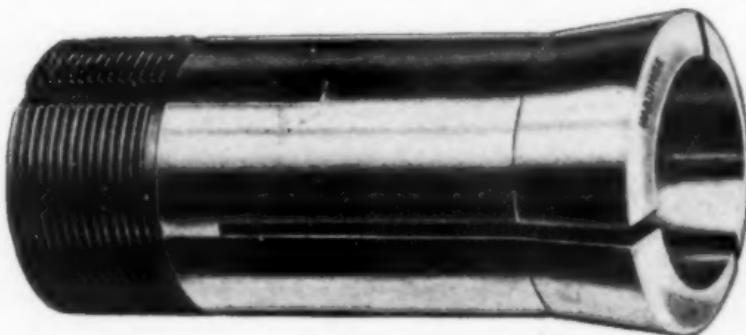
If you use tap and drill and would like to eliminate breakage arising from frequent grinding—would like to save the waste which results from excessive and too frequent grinding—would like to have your tools cut with almost half the power usually required—would like to save half the time now spent in grinding—would like to have your taps and drills stay sharp twice as long—would like to eliminate torn and stripped threads in your tapped holes and have the thread just right—in short, if you want to get rid of your tap and drill troubles and most of your tool cost—investigate this Grand Rapids Combination Grinder.

*Write for Complete Information TODAY
Use Quickmail Coupon No. 72.*

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303 STRAIGHT AVE., GRAND RAPIDS, MICH

COLLET AND FEED —HARDINGE—



Spring Collets for Your Lathes and Millers

Forty-seven years of manufacturing experience is your guarantee that desirable characteristics are embodied in HARDINGE Collets.

Make certain that the name HARDINGE appears on collets which you purchase for use with lathes and milling machines. The stamping on the face of the collet indicates that finishing grinds are made after hardening to assure concentricity.

Accuracy is always associated with HARDINGE Collets.

Durability with accuracy comes from special steel, uniform heat treated threads, hardened surfaces for gripping or bearing and spring temper for proper operation.

—Prompt shipment from stock—

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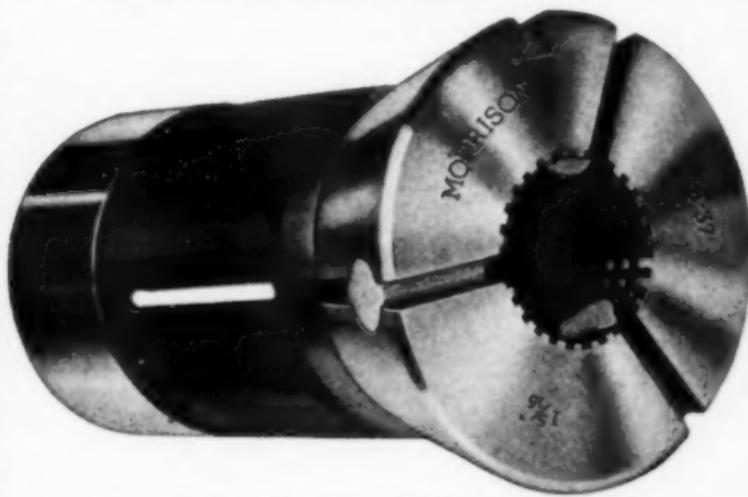
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HARDINGE BROTHERS, Inc. - - - ELMIRA, N. Y.

FINGER SECTION



MORRISON



Spring Collets and Feed Fingers for Your Automatic and Hand Screw Machines

Screw machine users decrease the "down" time and increase production by standardizing on MORRISON Collets, Feed Fingers and Pads.

Pioneers in supplying Collets, Feed Fingers and Pads for all screw machines, we developed special steels, heat treatment and incorporated features for improved performance and longer life.

Delivery is important—standard size Collets, Feed Fingers and Pads are carried in stock for immediate shipment. Sizes not in stock are made from blanks carried in stock.

Send Quickmail Coupon No. 3 for complete catalog No. 34.

—MORRISON means economy and performance—

MORRISON MACHINE PRODUCTS, Inc. ELMIRA, N.Y.

R AND L

Here's the answer to screw machine and turret lathe users who insist on better work—and demand savings. It may be used as a balanced turning tool, on quick rough cutting or fine precision turning. In 10 seconds it may changed from a Right to a Left hand turning tool. Only separate tools, costing four times as much, can do all the operations possible with R and L—and do them as well. For

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savings in operation—
and for better work,
R and L is your
answer.

**Entire tool is
made of heat-
treated alloy
steel.**

*Made in 5
standard sizes
—or built to
order in
accordance
with your
specifications.*



R and L Tools, 1825 Bristol St.,

Turning Tool

R and L does a better job and replaces seven ordinary tools. Set up as shown, it functions as a turning tool with drill. The floating construction allows the drill to be centered accurately, overcoming any discrepancies in the machine. This set-up is particularly advantageous on a multi-spindle machine where lack of a sufficient number of positions would otherwise involve subsequent operations.



Actually saving \$200 on initial cost alone, and affording a new basis for profitable operation, the R and L Turning Tool merits your investigation.

FREE—Send Quickmail Coupon No. 64 for your copy of the new 32-page R and L Turning Tool Manual. It describes the tools in detail and shows many profitable uses for these versatile tools.

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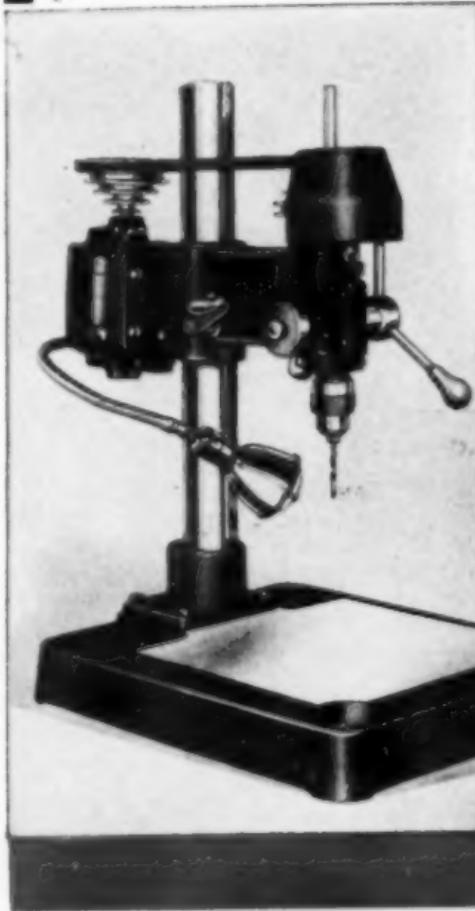
ANNOUNCING

the new

"Buffalo"

No 15

MANUFACTURING
DRILL



"Buffalo"

DRILLS FOR



IN announcing this new drill, "Buffalo" leads again in making a drill to fit modern manufacturing needs. It offers all the advantages of the rugged low-cost No. 15 drill plus new features to give quicker change of set-ups, correct take-up for wear, and adequate room for handling jigs and work pieces. Easier to operate. Least non-production time.

Drill is full ball bearing type. Has 5 speeds. Pulleys designed to carry the full capacity of standard "A" section V Belts. Table base is 18" x 22" with 14" x 14" true square working surface.

No detail has been overlooked to make the new "Buffalo" No. 15 Manufacturing Drill the finest tools class on the market.

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IN CANADA: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

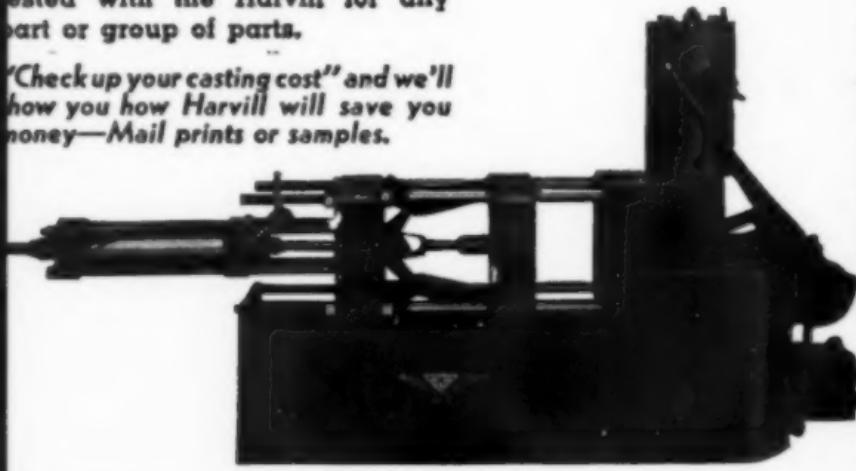
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MAKE YOUR OWN DIE CASTINGS WITH A SMALL INVESTMENT THAT YIELDS BIG PROFITS AND SAVINGS

This revolutionary machine eliminates "farming out" castings, split profits and uncertain production. Now you can cast your own products; make the profit yourself and have your castings when you want them. The Harvill costs only about one-half as much as other pressure die-casting machines of equal capacity, offers maximum production at minimum maintenance cost — can be operated by unskilled labor.

Dies can be furnished and tested with the Harvill for any part or group of parts.

"Check up your casting cost" and we'll show you how Harvill will save you money—Mail prints or samples.



HARVILL HIGH-PRESSURE DIE CASTING MACHINES

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2344 East 38th Street, Los Angeles, Calif.

Please send me your High-
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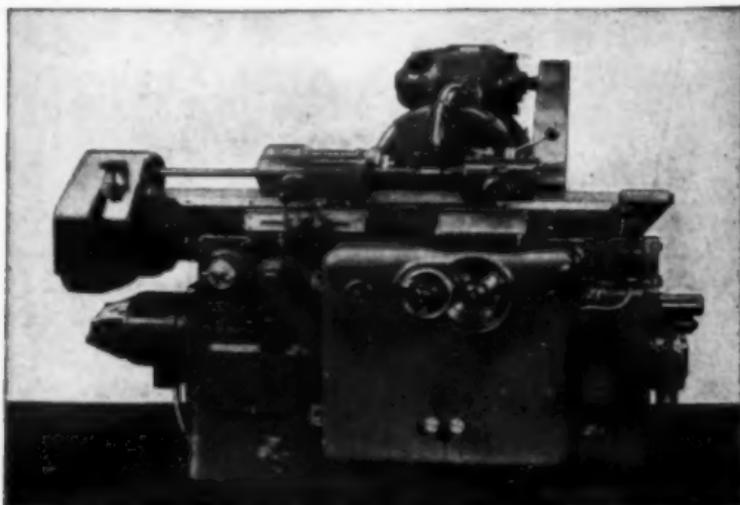
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"BACKED BY 18 YEARS OF THREAD GRINDING EXPERIENCE"



**COMPLETE COVERAGE OF ALL
THREAD GRINDING NEEDS
WITH THE J&L AUTOMATIC THREAD GRINDER**



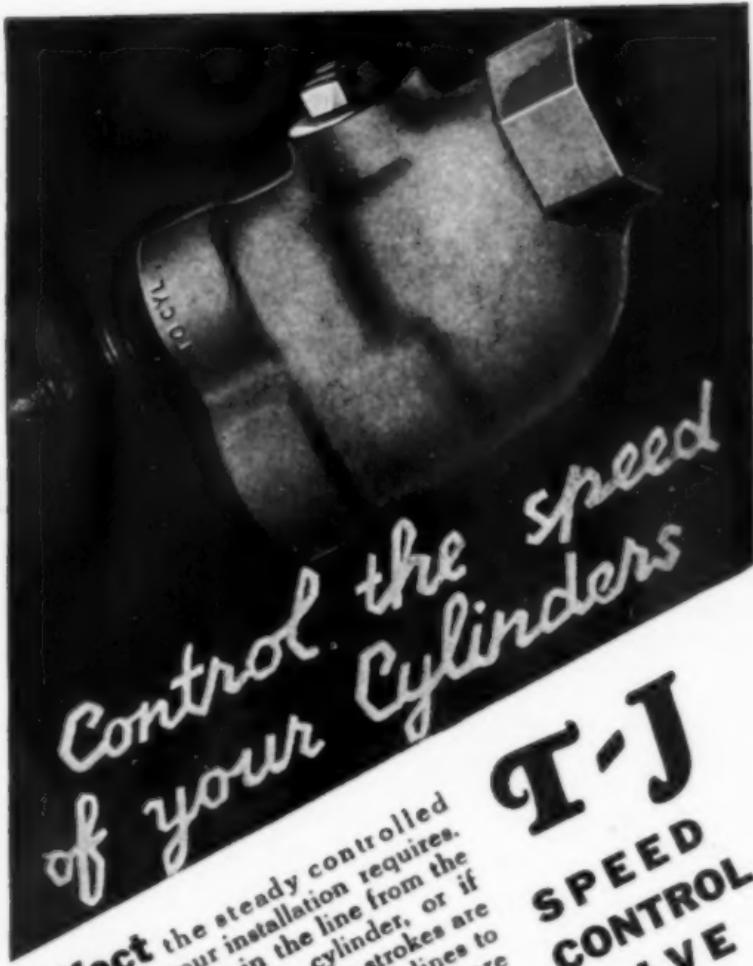
The J&L Automatic Thread Grinding Machine will grind right- and left-hand threads from 2 to 48 pitch inclusive; threads with single, double, triple, quadruple, or sextuple lead; and from the solid or from previously roughed threads.

With standard attachments the machine also will grind relief on taps and hobs, and jump flutes such as on inserted-blade taps. A hob grinding attachment permits grinding thread hobs without lead.

The J&L Automatic Thread Grinding Machine is designed for single piece or small lot runs, as well as for continuous production, where all the automatic features may be used to full advantage.

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*Control the speed
of your cylinders*

Effect the steady controlled stroke that your installation requires. Pipe one of these in the line from the operating valve to the cylinder, or if both the forward and reverse strokes are to be controlled, pipe one in the lines to both ends of the cylinder. These valves are available in $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", and 1" I.P.S.

Write for Bulletin No. SC-1 With
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THE TOMKINS-JOHNSON CO.
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Jackson,

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SPEED
CONTROL
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1905



1937

FLEXIBLE SHAFTS AND MACHINES



Quality Equipment Only

**FLEXIBLE SHAFT
MACHINES
OF MANY TYPES
AND SIZES**

**FOR HUNDREDS OF VARIOUS
OPERATIONS**

LET US KNOW THE KIND OF A JOB
YOU WANT TO DO. WE WILL FIT A
MACHINE PROPERLY FOR THE
WORK.

**OVER THIRTY-TWO
YEARS IN THIS
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Exclusive Manufacturers

**Flexible Shafts, Machines
and Attachments**

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N. A. STRAND & CO.

CHICAGO

5001-5009 N. Wolcott Ave.



ANGLE TAPPING with ABSOLUTE UNIFORMITY



One of a series of case histories showing tough jobs made easy by the Haskins Tapper.

Material

Drawn Steel Shell

Production

(3 holes) 330 pieces per hour

Size of Tap

1/4" straight pipe

Style of Tap

4 flute, cam face, special length

R.P.M. of Tap 'in'

550

R.P.M. of Tap 'out'

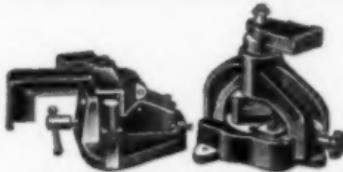
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A job "That Couldn't be Done" . . . NOW Done by the HASKINS Method

This job was a problem due to the fact that the face of the tapped holes is not at right angles to the tap. The tap must start cutting the thread on one side before the chamfer enters the hole. No three holes could be tapped alike. But Haskins had the answers: a rigid spindle . . . foot-pedal control . . . a simple fixture. No clamps. No hold-downs. Result: Three holes tapped on an angle with *absolute uniformity*. R.G. Haskins Co., 4654 W. Fulton St., Chicago. Send Quickmail Coupon No. 52 for booklet.



WHITNEY TOOLS

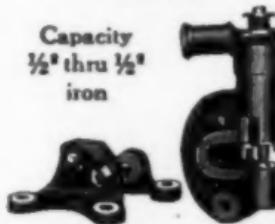


Angle Mitre Notcher and Angle Iron Bender

Capacity 2" x 2" x 1/4" angle iron or smaller. A pair of tools that every shop ought to have. They are Nos. 50 and 51 in our catalog.

No. 20 Ball Bearing Punch

Capacity
1/2" thru 1 1/2"
iron



No. 10 Ball Bearing Punch

Capacity 5/8 inch through 1/4 inch iron. Depth of throat 1 1/2 inch. Height of throat 1/8 inch. Furnished with one punch in any size from 1/8 to 1/2 by 1/32.

Whitney manufactures over 80 types of punches, shears and other equipment for metal working. Send Quick-mail Coupon No. 42 for a catalog of the complete line



No. 4 Angle Iron Shear

Capacity 2" x 2" x 1/4" angle
iron or smaller

Whitney Metal Tool Co.
ROCKFORD, ILLINOIS



**A NEW
CUSHMAN CHUCK CATALOG
No. 50-1937**

In addition to description and price listings of the complete Cushman Line of Precision-built Chucks, this new catalog gives for the first time a full listing of chucks adapted to the New American Standard Types A-1 and D-1 and to the Long Taper Key Drive Spindle Noses. Several important new chucks are included, together with progressive improvements in design of standard types.

A feature of great value to engineering departments is the inclusion of large scale blue prints and full dimension data for all chucks, jaws and component parts.

Send today for your copy.

The Cushman Chuck Company

Chucking Engineers Since 1862

Hartford, - - - Connecticut

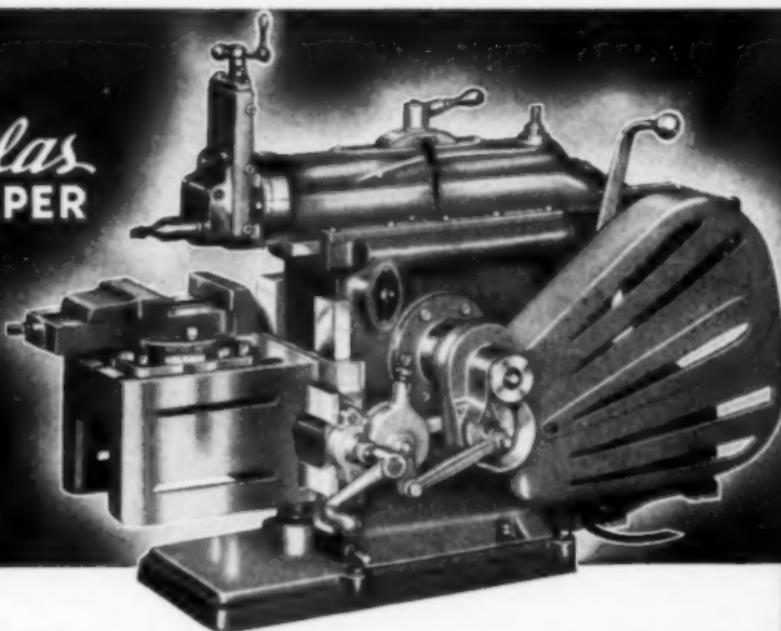
CUSHMAN



CHUCKS

Atlas ANNOUNCES A MODERN PRECISION 7" SHAPER FOR TOOL ROOM AND SHOP

THE
Atlas
SHAPER



How often have you wanted and needed a handy bench shaper to shape up a part in a hurry and let you get on with your job? Atlas now provides such a tool in this new 7" shaper.

It has everything you expect to find in a dependable shaper, built down to scale for greater efficiency on small work. And its price sets a new standard of value in metal shapers, plus the economy of a $\frac{1}{2}$ h. p. motor.

Here are a few performance details. The drive is standard bull-gear type powered by V-belts from motor to spindle. 4-step countershaft and pinion-shaft pulleys produce 4 speeds between 45 and 200 strokes a minute. 5 surface feeds in either direction.

You'll find many ways to put this new Atlas Shaper profitably at work. Send Quickmail Coupon No. 34 today for complete specifications.



ATLAS PRESS CO., 1150 N. Pitcher St., Kalamazoo, Mich.

Factory Displays at: Chicago 35 E. Wacker at Wabash
New York 130 W. 42nd St. Philadelphia 113 N. Third St.





Presenting the New **STARK INTEGRAL DRIVE PRECISION BENCH LATHE**

On this distinguished occasion, the Stark Tool Company announces its **INTEGRAL DRIVE PRECISION BENCH LATHE**...the first lathe of its class with built-in, gearless drive, giving any speed at the turn of a wheel. Fashioned in its finest tradition by the Originators of the American Bench Lathe, this new tool has precision double-taper or anti-friction bearings, clutch, brake and other features which will interest the man who wishes the utmost in accuracy, easy handling and compactness.

1862

"Stark"
OF WALTHAM

1937



For Heavy **GRINDING**

On heavy construction work—where power, speed and portability are factors—you'll find new economy, new plant efficiency and increased production capacity with HASKINS.

Before installing any flexible shaft equipment consider the greater adaptability of HASKINS . . . the wide range of equipments . . . the many accessories that are available for various types of work.



*Use Quickmail Coupon No. 2.
It will bring you catalog—full of valuable information.*

R. G. HASKINS CO.
4654 W. Fulton St.
CHICAGO



The Punch Press Sensation!

SUPER SPEED

PUNCH PRESS

No Vibration
INSTANT STOP
Quick Change

ACCURACY
Feed Control
While Punching

AN ENTIRELY NEW PRINCIPLE

1,000 STROKES EACH MINUTE
SINGLE DIE — 1,000 BLANKS

HOW? By using the SUPER SPEED PUNCH PRESS with its continuous feeder which never allows the stock to stop.

No cams, pawls or ratchets.

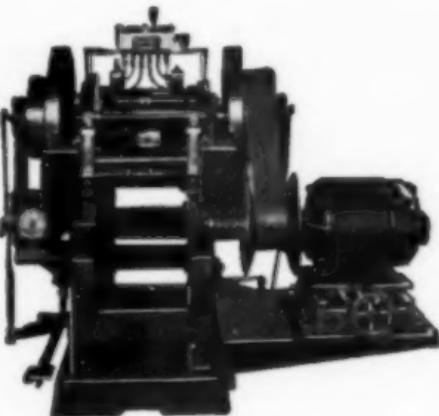
Greatest advance in speed since inception of punch presses.

Guides below punch level.

Variable speed control.

Operates with a single die. No costly "ganging" of dies.

High production means minimum labor cost.



Its production value has been fully proved.
Send samples of blanks for guaranteed production.

NOW BEING USED BY SOME OF THE LARGEST INDUSTRIAL COMPANIES!

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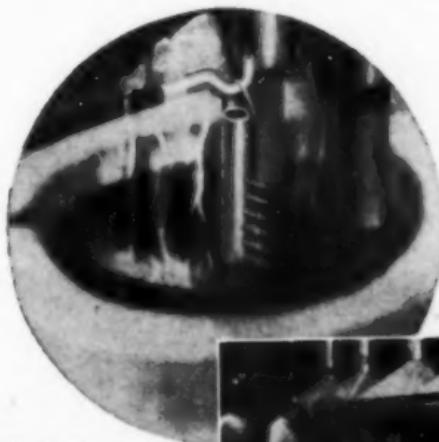
SUPER SPEED PRESS CORPORATION

Factory:
Reading, Pa.

Office: 55 Liberty St.,
New York, N.Y.

The REASONS WHY Putnam Tools Cut Faster—Last Longer

Controlled Hardening



Illustrations show
submersion of
Putnam End Mills;
the four furnaces of
graduated heats;
the control panel.



of PUTNAM TOOLS

by the
Salt-Bath Process

TYICAL of the advanced methods used in the manufacture of Putnam Tools is the heat treating process—the most up-to-the-minute method in use today. Every tool is submerged in four successive salt baths, in which uniform temperatures are maintained constantly by special electrical controls.

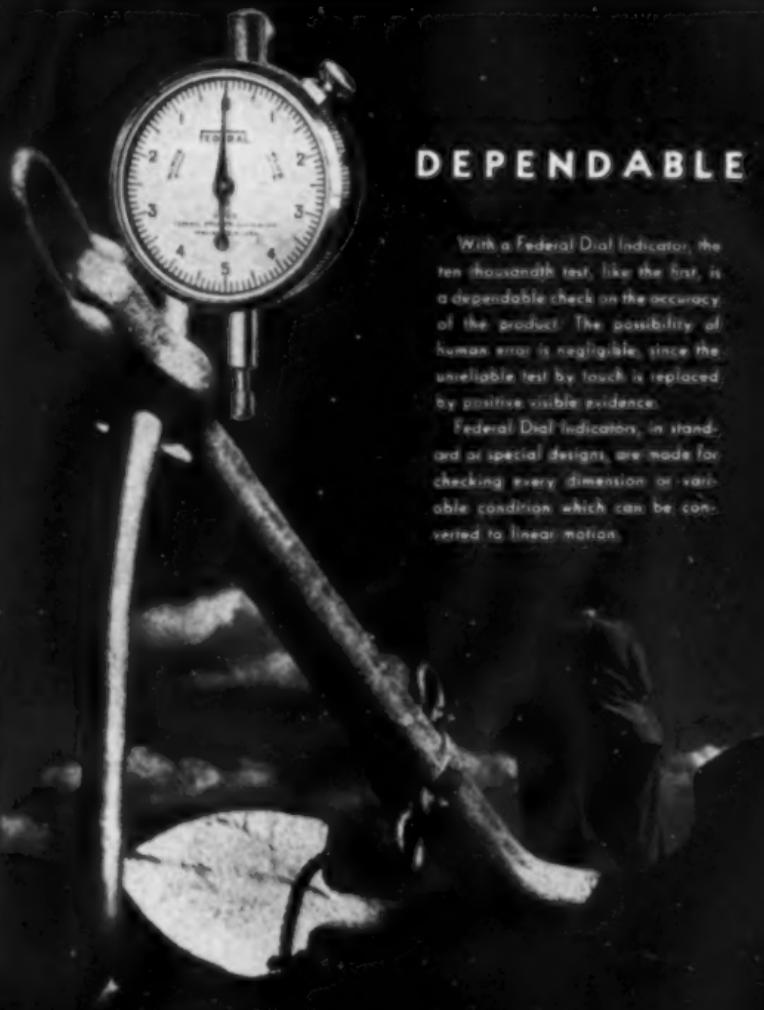
This method prevents oxidizing and scaling. No decarburization occurs. As every portion of the tool reaches the proper temperature at exactly the same time there is absolutely no distortion. It assures the maximum in cutting tool accuracy and durability.

Quickmail Coupon No. 67 will bring you our catalog listing complete information and prices on Putnam end mills, counterbores and reamers.

PUTNAM TOOL CO.

2983 CHARLEVOIX AVE.

DETROIT, MICH.



DEPENDABLE

With a Federal Dial Indicator, the ten thousandth test, like the first, is a dependable check on the accuracy of the product. The possibility of human error is negligible, since the unreliable test by touch is replaced by positive visible evidence.

Federal Dial Indicators, in standard or special designs, are made for checking every dimension or variable condition which can be converted to linear motion.

FEDERAL PRODUCTS CORPORATION
1144 EDDY STREET, PROVIDENCE, R. I.
DETROIT • CHICAGO • MUNCIE • CLEVELAND • NEW YORK

Send Quickmail Coupon No. 54 for catalog

LOOK'em All Over!



Then Check Queen City Grinders Against Higher-Priced Competitive Makes

Compare the mechanical features . . . give everything the closest scrutiny. Note that Queen City motors are heavy duty ball bearing Induction—not slower speed split-phase motors. Queen City motors are not overrated—they deliver the full rated power.

Compare These Prices:

1/3 hp.....	\$ 29.50
1 hp.....	112.50
2 hp.....	168.50
3 hp.....	218.50
5 hp.....	268.50

All Queen City Grinders are equipped with high grade Carborundum wheels at no extra cost.

The 3 and 5 hp. models have shatterproof glass eye-shields—1 hp. and larger models have provision for hooking up to exhaust systems. These are just a few of the many superior features.

Quickmail Coupon No. 32 will bring
you the whole story

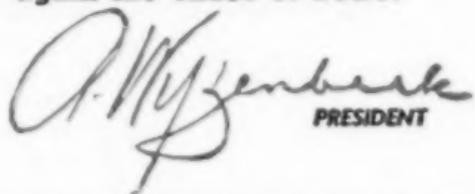
Try a Queen City for
30 days. If you're not
entirely satisfied, just
return it.—that's all.

QUEEN CITY MACHINE TOOL CO.
CINCINNATI, OHIO.

TIME HAS NOT CHANGED OUR APPRAISAL OF THE POWER OF "JOHN Q. PUBLIC"

LAST Spring we expressed our convictions against the fast-growing epidemic of price hoisting. Since then the epidemic has almost faded away.

We do not take the position that natural ebbs and flows of commodity prices are not justified and necessary; nevertheless, we still maintain that stimulated and unreasonable price increases tend to disaster. Therefore, we continue to practice and counsel moderation so as to avoid once again the chaos of 1929.



A. Wyzenbeek
PRESIDENT

Wyzenbeek & Staff, Inc.
CHICAGO

WYCO

**Flexible Shaft
Equipment**

FOR PRODUCTION WORK

Model No. 40—1 H.P.

3 SPEED

V-BELT DRIVE 900—1800—3600

PRICE
COMPLETE
WITH 6"
GRINDING
WHEEL and
WHEEL GUARD

\$138



**FOR SNAGGING CASTINGS, GRINDING WELDS, POLISHING,
SANDING, WIRE BRUSHING, etc.**

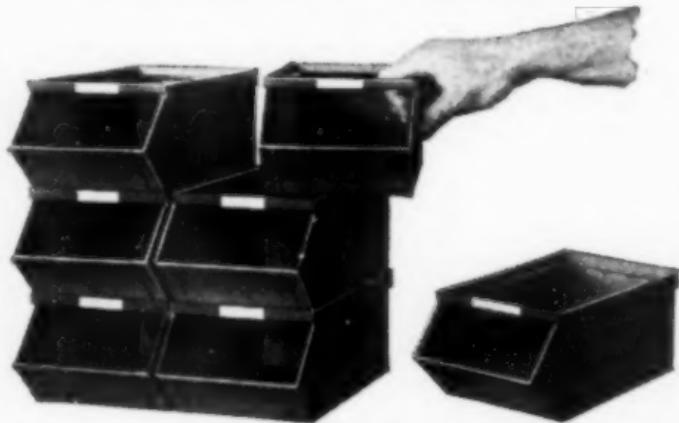
Send Quickmail Coupon No. 19 for Catalog of the complete WYCO line.

WYZENBEEK & STAFF, INC.

642 WASHINGTON BLVD.,

CHICAGO, ILL.

SAVE SPACE, TIME and LABOR with the ORIGINAL STACKBINS at NEW LOW PRICES!



The contents of each individual STACKBIN are always accessible — without disturbing the ones above or below.

Only the ORIGINAL STACKBINS have perfectly smooth interiors and full hopper fronts—to allow free flow of materials — and the patented angle stacking rim on all four sides—to insure permanent rigidity under any conditions.

Send the coupon today for the complete story of STACKBINS — and NEW LOW PRICES. You'll find they save time and money—pay for themselves by creating greater efficiency.

**STACKBIN
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PROVIDENCE, RHODE ISLAND

Stackbin Corp.,
55 Troy St.
Providence, R. I.

I want to see how the original STACKBINS can save me money. Please send complete information.

Name _____

Firm _____

Address _____

ROSS Air Control VALVES

ALL PORTS ON ONE FACE

This permits mounting on a bracket to which piping is permanently installed — then to remove valve you need only loosen four bolts. Also allows gang mounting of valves in minimum space and in any desired position. This simplified design makes installation easy.

Poppet type offers lightning-like action. Positive air pressure seal gives maximum efficiency. Short throw makes Ross the ideal valve for mechanical control. Reliable, smooth operation of your air actuated equipment assured when you install Ross valves.

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ROSS OPERATING VALVE COMPANY
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Detroit, Mich.



THE BRIDLE FOR AIR HORSEPOWER



HAND
CONTROL



FOOT
CONTROL



SOLENOID
CONTROL



MECHANICAL
CONTROL

A SIZE AND TYPE FOR EVERY OPERATION

SUTTON MASTER FEED FINGERS

For automatic
and hand screw
machines.



**WITH INTERCHANGEABLE AND
REPLACEABLE PADS**



Hardened
Steel, Iron or
Bronze

Double angle on sides of pads permit worn pads to be brought back to gripping size by grinding down angles and allowing tension of master to bring pads closer together.

Pads
Changed
Easily



Spreaders furnished with fingers permit pads to be changed quickly and easily. No pins or screws to hold pad in master.

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**Have you ever used a
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The B-3 Vertical Grinder with a 6-inch wheel, high speed, runs at 5600 R. P. M. It is easy to handle, and gives steady, everyday hogging performance.

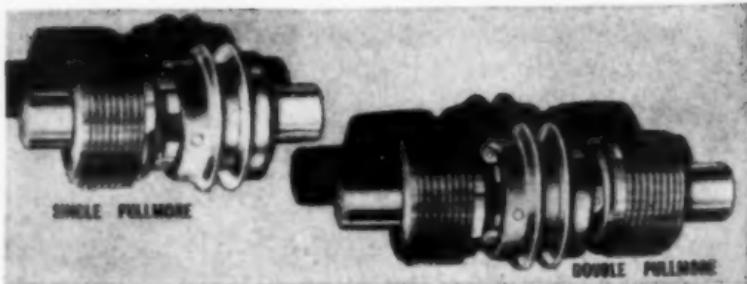
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ROTOR

AIR TOOL
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Control Main Drives, Auxiliary Mechanisms, Other Equipment

Their compactness, and the ease with which they are adapted to design requirements have won a variety of assignments for Pullmore Clutches. They are used as main

drive clutches carrying all the load, as auxiliary clutches controlling individual units, and in power take-off mechanisms to operate other equipment. Double-type Pullmore Clutches are applied as clutch and brake, for forward and reverse movements, and for high and low speeds.

Compact, reliable, efficient, durable; Pullmore Clutches provide an economical solution to your clutch problems. They are available in single and double types, for operation in oil or dry, in capacities from 1 h.p. to 75 h.p. at 500 r.p.m. The specialized services of our engineering department are available, without charge, to design the Pullmore Clutch application which exactly meets your requirements. Investigate.

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NOPAK

3 and 4-Way Operating Valves

FOR AIR, WATER AND O



3 and 4-Way Foot Operated



3 and 4-Way Hand Operated

- The flat disc type design incorporated in the NOPAK valve permits uniform lapping of the disc and seat, allowing continual operation to actually improve the sealing surfaces.
- NOPAK valves utilize the pressure to seal the valve at all times, are easy to operate, provide positive action, and full pipe area through the valve.

- * No Packing
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- * Leakproof
- * Protected Disc and Seat
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* * SCULLY-JONES Turret Tool Holders,
Sleeve type and Extension type are designed
for use on Turret Lathes and Screw Machines.



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SCULLY-JONES & COMPANY

1905 SOUTH ROCKWELL STREET • CHICAGO, ILLINOIS

A Time Saver In Any Shop

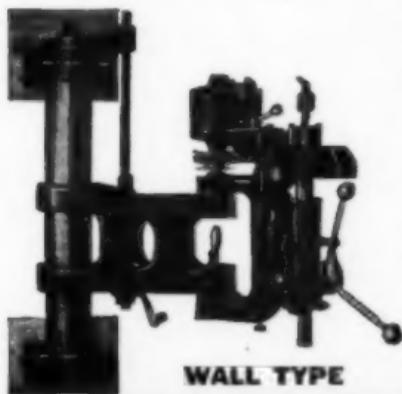
AYER SENSITIVE BENCH RADIAL DRILL

A rugged, modern, ball bearing sensitive drill with all the advanced features are found in this high class tool.

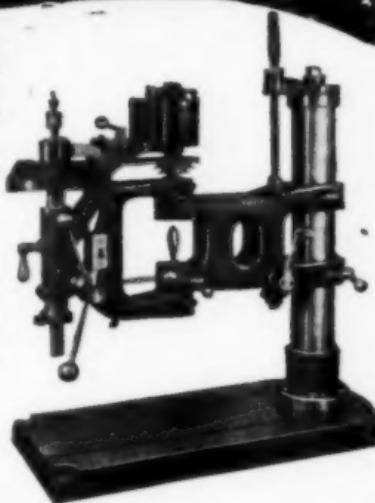
Sensitive balance of spindle at all speeds is provided by long extension spring within drill frame.

Depth gauge and graduated sleeve are also provided.

Drill capacity $\frac{1}{2}$ "; minimum distance spindle to column 6"; maximum distance $31\frac{1}{2}$ "; minimum distance spindle nose to base 4"; maximum distance 21"; spindle travel 5"; spindle bore Morse No. 2; high grade geared $\frac{1}{2}$ " chuck furnished in place of Morse Taper if preferred.



WALL TYPE



Furnished in either bench or wall types. Spindle can be equipped with tapper and motor equipped with reverse switch also motor bracket is located for larger or different make motors.

Quickmail Coupon No. 15 will bring you full information and low prices.

Choice territory open to progressive dealers.

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CHICAGO HEIGHTS, ILLINOIS**

Three Cost Reducers



for the Metal Working Shop

Almost every plant has use for one or all of these low-temperature-melting alloys. Among other useful qualities, they have the unique characteristic of expanding on solidification. Remarkable savings in many metal-working operations such as securing punch and die parts, preparing master patterns, filler for heading thin-walled tubing, electroformed molds for rubber and plastic products, masks for spraying, proof casting for forging dies, anchoring parts in machine tools without drive fits and a hundred other uses.

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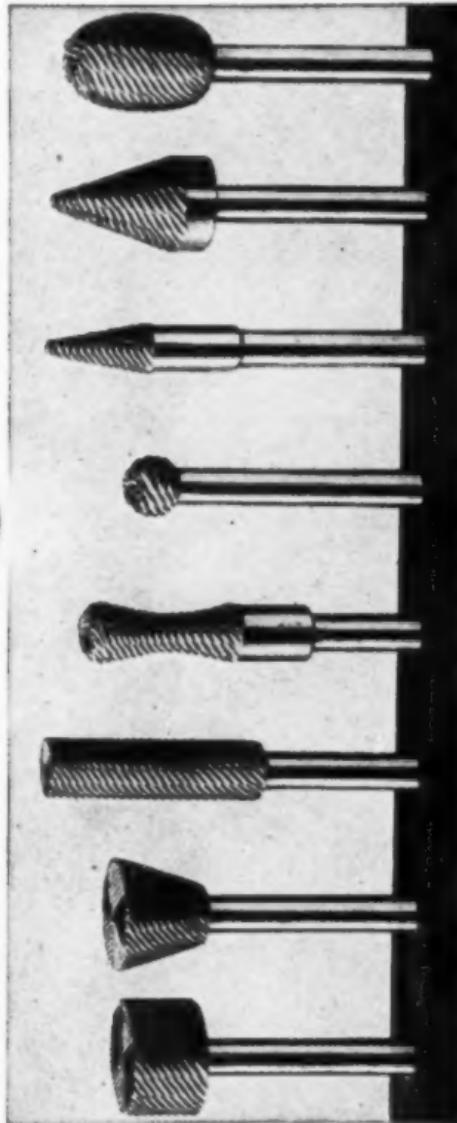
CERRO DE PASCO COPPER CORP., 44 Wall St., NEW YORK, N. Y.

British Associates: Mining and Chemical Products, Ltd., London, England.

FORD HAND CUT



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Just a few of the many standard shapes which are carried in stock
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Siewek Rapid
Clamping **Drill Jigs**
A TYPE FOR EVERY JOB!



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The SENSATIONAL



Insert Chaser Die Heads

bring you

1—Lower Threading Costs

The very low price of H & G Insert Chasers, together with the most extraordinary wearing qualities, results in much lower chaser costs per thousand pieces.

2—Simplify Thread Cutting

The very simplicity of this tool in which worn chasers may be replaced by new with only a few minutes of lost production time and eliminating the necessity of making adjustments, naturally results in higher net production.

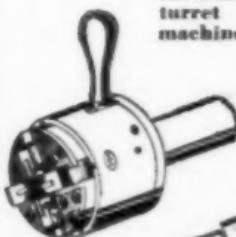
The regrinding of chasers is no longer a problem.

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STYLE MS

for hand
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STYLE IMM →

is equipped with im-
proved internal trip
for shoulder threading
such as for spark plugs

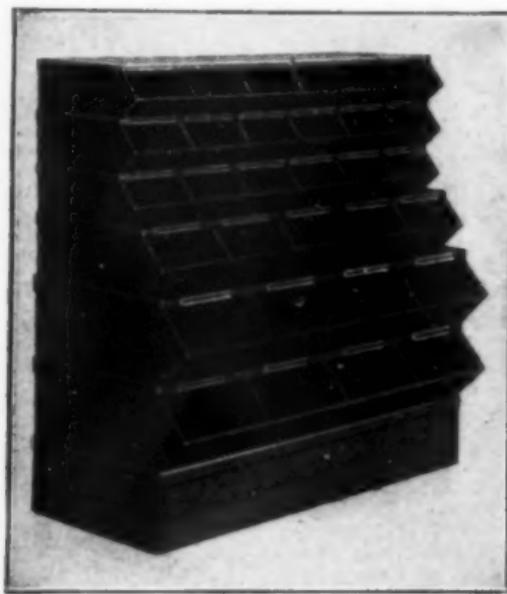


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has receding chasers for
cutting superior quality
taper threads.

A SECTIONAL STOCKROOM COSTS NOTHING TO BUILD

STACKBIN sections stack securely one above the other—form a vibration-proof storage unit that can be set up or moved quickly and easily, without tools, by any man in your plant.



Ideal for storage of small parts or materials, STACKBINS eliminate waste motions because they can be carried to the assembly line and quickly set up near machines or on benches. The hopper fronts keep contents always visible—the smooth interiors speed up handling.

It costs you nothing to see how Stackbin sections can cut your handling costs. Write to-day for full information.

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Please send me further details on the Stackbin method.

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Spring tempered **COLLETS**

Order From Stock

Scientifically heat treated to a true spring temper, "Rivett Mark" collets resist wear and hold their spring longer than collets of any other make. As standard equipment on all makes of lathes and millers, (see Rivett Bulletin 100B) they may be ordered for immediate delivery from the following stocks —

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No. 24 when you write for Bulletin 100B.



SAVE \$100 TO \$300 MONTHLY WITH THIS LINCOLN WELDER

You are bound to profit by changing over to electric welding with a new Lincoln Machine Shop Welder because:
ONE—You can weld twice as fast as with the old process.
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THREE—You can fabricate, repair and hard-face more jobs successfully, resulting in savings that can pay for the welder in little time.

Machine shops report savings of \$100 to \$300 monthly with this powerful, motor-generator type arc welder. Mail the coupon for details.

THE LINCOLN ELECTRIC COMPANY

Largest Manufacturers of Arc Welding Equipment in the World

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**THE LINCOLN ELECTRIC CO.
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Send a free copy of Bul. 314 and easy payment details on the Lincoln Machine Shop Welder.

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**For sanding smooth after
grinding — THE KELLERFLEX
Right Angle Attachment**

Designed especially for production work on flat and convex surfaces such as large dies, propellers, automobile fenders, bodies, etc. The housing is cast from special non-expanding aluminum alloy for strength and lightness. Spiral bevel gears are matched and lapped in pairs. Driven and driver spindles are made to close tolerances, heat treated and ground. Double ball bearings absorb all thrust. Shielded ball bearings are used throughout, and the entire attachment sealed to keep out foreign material. Made in ratios of 1:1, 2:1, 3:1. Sanding is done with abrasive discs of different grits depending on the finish required. Can be adapted to any flexible shaft machine using $\frac{1}{2}$ " or $\frac{3}{4}$ " cables.

Use Quickmail Coupon No. 66.

PRATT & WHITNEY
KELLERFLEX SALES DEPT.
Div. N-B-P Co. Hartford, Connecticut

INVENTORY REDUCTION

RYERSON NO. 1 HORIZONTAL DRILLS



New Machines Offered at Half the Original Price

These flexible, efficient No. 1 drills are being offered for immediate clearance at the extremely low price of \$1000.

They combine a wide working range with low operating costs, and have proved equally efficient on large bulky parts and small pieces running on production schedule. These machines permit a big saving in set-up time.

Ryerson No. 1 Horizontals are of the fixed column type, the work being mounted on a rolling table to secure the necessary horizontal adjustment. All control levers, including electrical control, are mounted on the spindle head. Spindle feeds are arranged in geometrical progression. Four feeds are furnished and can be changed without stopping the machine.

Write for specifications and complete description

JOSEPH T. RYERSON & SON Inc.,
Chicago, Milwaukee, St. Louis, Cleveland, Detroit, Cincinnati,
Buffalo, Philadelphia, New York, Boston

Send Quickmail Coupon No. 74 for further information.

HITCHCOCK'S
Machine Tool
BLUE BOOK

Selected
Circulation

25,000
Monthly

NOVEMBER, 1937

THIRTY-SECOND YEAR

A GOOD OUTLOOK

The Index of Machine Tool Orders increased from 171.1 in July to 179.8 in August, and 210.7 in September. Complete reports have not been received for October, but evidently there has been some recession from these high figures.

The stock market slump no doubt was accentuated by the fact that the margin operators were caught by the Government regulations. It did not fully reflect business conditions.

The psychological effect on business, however, has been to cause a waiting policy, which should soon wear off. There is too much increased buying power in the country, especially among the farmers, to permit any major recession.

Our guess is that business will soon regain its stride and forge ahead.

Published By

Hitchcock Publishing Co.
508 S. Dearborn St., Chicago, Ill.

Consult the Classified Finding Index for your requirements

Broach Versatility

The flexibility of modern broaching equipment is shown in a standard vertical pull-up type machine, built and tooled by Colonial Broach Co. for the broaching of spiral internal gears and five different sizes of pump bodies in the same machine.

The machine is a standard Colonial VG1-10-48 with 48 inch stroke and 10 ton capacity. The illustration shows the machine with the lower cover plate removed to expose the operating mechanism. The helical bar on front of the machine is for rotating the broach during the broaching of the internal teeth on the gears mentioned.

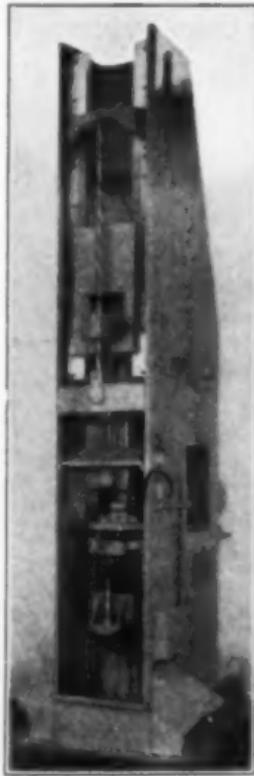
Near the bottom of the bar on the ram head—which is in its lower or starting position—may be noted a lever with which this guide bar can be engaged.

Operating cycle on the pump bodies is: (1) Loading part into fixtures; (2) Machine brings broach up from bottom to engage automatic puller in the ram; (3) Broach is pulled through work with machine stopping at top of stroke; (4) Work is removed and broach is returned to base of machine, released and machine reset for reloading, all automatically.

Chips drop through into base of machine where they may be removed from either side. Stroke is adjustable, permitting a shorter stroke on the pump bodies than on the gears. Variable speed control is provided.

New Compact Slide Cushion

The Marquette Tool & Mfg. Co., 1420 Hastings St., Toledo, Ohio, a division of E. W. Bliss Co., announce a new compact pneumatic slide cushion. Mounted under the slide, as shown, this cushion can be used



(Continued on Page 48)

DO IT—

Better—Faster—for Less!

with ODIN UNIVERSAL

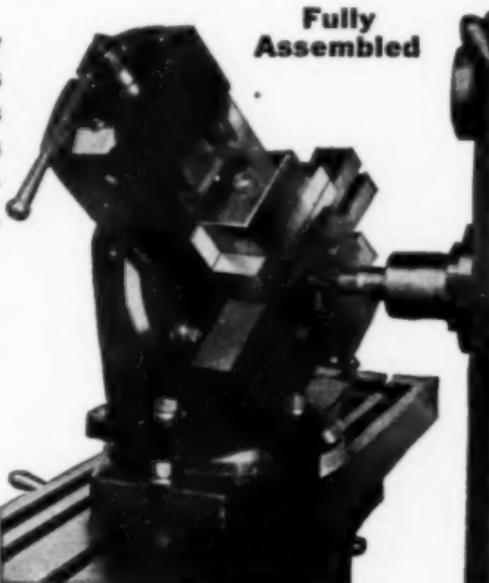
Precision Vises
Swivel and Plain

with Interchangeable Jaws and
Hardened and Ground Parallels

They quickly pay
their costs in savings
on High Tool Costs
—Expensive Fixtures
—Patterns and cast-
ings—Extra Set-Ups.

Investigate the
money saving
possibilities of
ODIN VISES

Send Quickmail Coupon
No. 71 for full facts
and prices.



Let us show you how to make cheaper and better jigs and fixtures at a greatly reduced cost—with a great saving in time.

ODIN UNIVERSAL
CORPORATION

CHICAGO

Sales Division
110 S. Dearborn st.,

Telephone
Franklin 3281

in conjunction with Calleson blanking, drawing and curling dies to replace the springs or rubber cushions, and they are said to be equally adaptable to stripping and blanking operations.

The functioning of this cushion as a stripper is claimed to have a number of advantages over the spring type. No jacking-back of the stripper plate against stiff springs is necessary when setting dies. All that is required is to release air from the cushion and the stripper plate will easily slide back out of the way. It is pointed out that as no springs are used, their possible breakage is avoided. Further, it is possible to control the stripping in a positive manner so the cushion will operate at the correct moment.

It is asserted to be possible through the use of these cushions and the regular cushions in the bed, to convert a single-action press into a triple-action press.

Using these cushions with Calleson dies, cushion and draw ring proceed down together, blanking and drawing the shell. In the next step, the upper draw ring recedes while the lower forming die, actuated by either the cushions or springs, pushes upward, forming the edge curl against the pressure of the slide cushions, pushing on top of the cover. When the edge is completely curled, the slide cushions recede with the upper draw ring while the lower forming die ejects the shell. The stroke of the slide cushion must be the length of the edge curl.

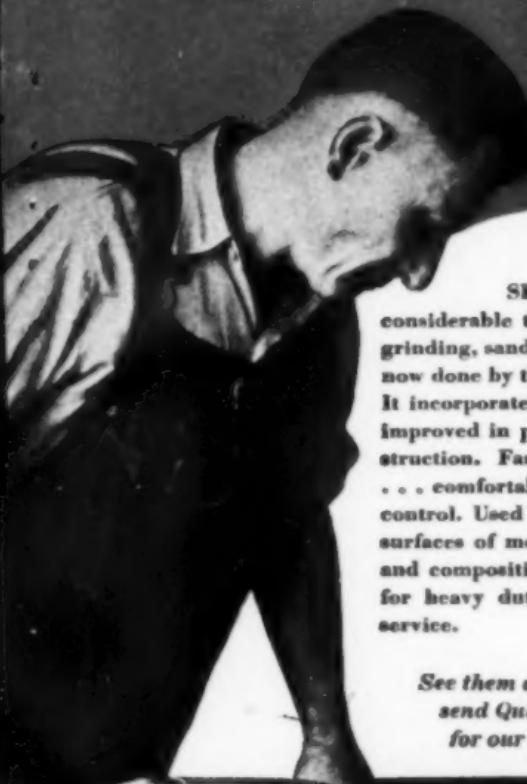
A flexible hose connects the cushion with the air supply.

The cushions are built in all sizes. Full information may be obtained by writing the makers on your business letterhead, mentioning The BLUE BOOK.



**REMOVE STAINLESS STEEL
WELDS EASIER, QUICKER**

with **SKILSAW**
**DISC
SANDER**



Let this new streamlined SKILSAW Disc Sander save you considerable time, labor and money on all grinding, sanding and polishing operations now done by the slow, costly hand method. It incorporates everything that is new and improved in portable tool design and construction. Fast and powerful in operation . . . comfortable and easy to handle and control. Used for flat, concave and convex surfaces of metal, wood, stone, marble, tile and compositions. Two powerful models—for heavy duty and constant production service.

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for our new complete catalog.*

SKILSAW, INC. 3318 Elston Ave., Chicago

214 E. 40th St., New York—52 Brookline Ave., Boston—1429 Spring Garden,
Philadelphia—812 Olive Ave., Los Angeles—2065 Webster St., Oakland

A New Eisler Catalog

Eisler Engineering Co., 740 South 13th St., Newark, N. J., announce a new spot welder and welder tips catalog No. 38W containing sketches and drawings of various types of spot and butt welding. Comprising 100 pages, the new catalog presents 1250 illustrations bearing on various welding problems. A copy will be mailed you on request.

Ayer Offers New Sensitive Radial Drill

A new radial bench drill, also available in wall or post types, is being offered as a useful addition to any shop, by F. H. Ayer Mfg. Co., Chicago Heights, Ill.

Design and construction of the new drill present many interesting features. The $5\frac{1}{2}$ inch supporting column is especially rigid with heavy internal ribs from top to bottom and the arm construction is sturdy.

Spindle diameter at the smallest part is $\frac{3}{4}$ inch, made of high grade alloy steel. Addition of any of the popular tappers makes an efficient tapping machine.

Sensitive spindle balance at all speeds is effected by a long extension spring inside drill frame. Spindle travel is equipped with depth gauge and a graduated collar is also provided.

A high grade motor, universally serviced is furnished, equipped with sealed ball bearings said to require attention once in two years in normal service. V-belt pulleys are balanced. Motor bracket has a sliding movement with lever control for quick belt change. Motor bracket is located for larger or different make motors.

High grade geared $\frac{1}{2}$ inch chuck is optional instead

(Continued on Page 52)

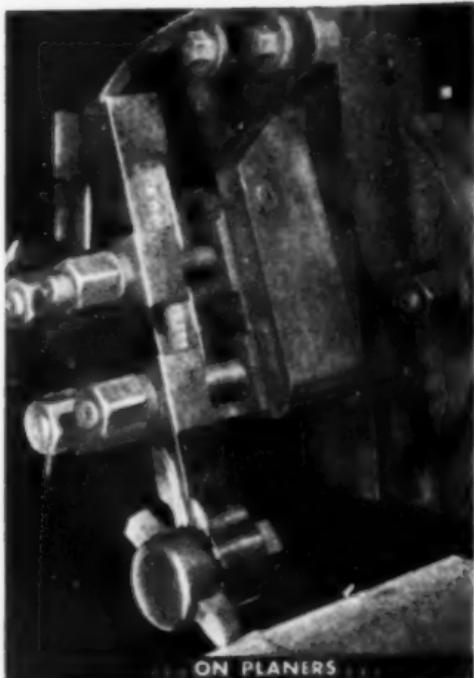
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Take the
final step
in
EFFICIENCY

the complete **ARMSTRONG SYSTEM**



ON PLANERS

The first big step in cutting cutting-costs on lathes, planers, slotters and shapers is to replace all forged tools with ARMSTRONG TOOL HOLDERS thereby "Saving all Forging, 70% Grinding, 90% High Speed Steel", ending losses in costly tool stumps and uncertainty in tool performance. The second big step, equally important, is the adoption of the complete Armstrong System—the use of the right ARMSTRONG TOOL HOLDER for each operation.

Over 96% of the Machine Shops and Tool Rooms are using ARMSTRONG TOOL HOLDERS today. Each ARMSTRONG TOOL HOLDER is a permanent multi-purpose tool that with a few cutter bits quickly ground from standard high speed steel shapes, does the work of a complete set of forged tools.

Send Quickmail Coupon No. 6 for catalog.



Armstrong Bros. Tool Co.

"The Tool Holder People"

308 N. Francisco Ave., Chicago, U.S.A.

Eastern Warehouse & Sales: 199 Lafayette St., N.Y.
San Francisco, London

of Morse Taper on spindle.

Equipment comprises $\frac{1}{3}$ h.p. motor, toggle switch, attachment cord, also V-belt of best quality.

Write direct to the makers, on your letterhead, for any further information, using Quickmail Coupon No. 15.

Wyzenbeek & Staff Add New Model

A new flexible shaft machine designed particularly for production work is announced by Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago.

Designated as their Model No. 40—1-H.P., the new



unit is equipped with a three-speed V-belt drive providing a 900-1800-3600 r.p.m. speed range, and is particularly recommended for snagging castings, grinding welds, polishing, sanding or wire brushing.

The makers will be glad to supply you with full information. Write them on your letterhead.



**68 Sizes and Types of Lathes
for every purpose.**

9" lathe prices start at \$297
11" lathe prices start at \$371
13" lathe prices start at \$448
15" lathe prices start at \$544
16" lathe prices start at \$642

**Send Click rail
Coupon No. 78 for
BULLETIN**

Bulletin No. 13-C illustrates, describes and prices the different models of the 13-inch lathes. Copy sent free, upon request.



SPEED, precision, versatility, and smooth, quiet operation are qualities of the new 13-inch South Bend Series "T" Lathes that have made them the choice of engineers and mechanics everywhere. Hundreds of manufacturing plants, machine shops, and tool rooms depend upon the rigid construction and fine workmanship of these lathes for the most precise tool and gauge work, and speedy, accurate production jobs.

SOUTH BEND LATHE WORKS
194 East Madison St., South Bend, Ind., U.S.A.

SOUTH BEND *Precision* **LATHES**
MODERN LATHES FOR MODERN INDUSTRY

Toledo 57-A Single and Double Action Press

For general utility purposes, the single action press with built-in drawing cushions to do double action work is increasing in popularity. Some interesting angles on this combination are presented by the new design of the Toledo 57-A press illustrated.

The press is fitted with a semi-built-in heavy duty Marquette hydro-pneumatic die cushion. In its high range, this cushion is said to give about twice the normal blankholding pressure, adapting the unit to shape-stretching jobs requiring very high gripping pressure around the edge of the blank. On such work, the makers say, it is possible to use gripping pressures equal to or exceeding the drawing pressure. The use of high blankholding pressures, particularly with deep draws, involves a decided increase in capacity of the whole driving train on the press, including flywheel and motor. For equivalent work this puts the single action machine and cushion in the price class of the equal double action toggle press. Here, the makers point out, the single action job has advantages in suitability for single action work and in convenient holding pressure control for double action work. On the other hand, the toggle double action press has advantages in positive gripping for stretching jobs with draw beads and in power economy on deep draws.

The press shown is made by The Toledo Machine and Tool Co., Toledo, O., a division of E. W. Bliss Co. It is a double geared, single end drive, single action press with a gear ratio of 16:1, affording a speed of 22 strokes per minute. A 10 h.p., 1200 r.p.m., high slip motor drives the flywheel through V-belts. Push but-



(Continued on Page 56)

Make A JIG BORER Out Of Your Drill Press



with a **MICRO-PRECISION UNIVERSAL JIG**

It's as simple to use as setting and reading a micrometer. Saves valuable time of expert machinists and tool makers—assures speed and accuracy. From a dollars-and-cents angle you cannot afford to be without this newest precision layout and drilling aid, which is already in use in the tool rooms of many leading industrial companies.

10 DAYS' FREE TRIAL ON THIS MODEL Standard model, capacity 14 x 8 x 2 inches. 10-Days' Free Trial on this Model Only.

\$185

F.O.B. Batavia

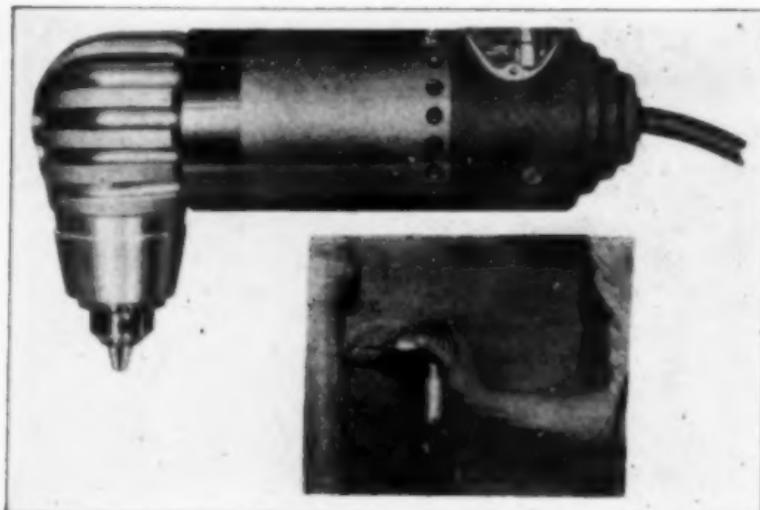
Larger Model, 14x12x3—\$215—Special sizes made to order. Send Quickmail Coupon No. 33 for illustrated leaflet giving complete information.

HENDERSON & KAYE, Batavia, Illinois

tons control the multiple disc air-operated friction clutch for inching, starting or stopping the press. All main bearings are bronze bushed, lubricated by a manifold one-shot system. Stroke is 10 inches, adjustable for 4 inches; shut height, stroke down, adjustment up, bed to slide is 20 inches; bolster thickness is 4 inches; crankshaft is 6½ inches at bearings and 9¾ inches at the pins; bed area is 32x32 inches. The slide is counterbalanced by a weight in the gear wheel. The self-contained Marquette hydro-pneumatic cushion makes it possible to draw a shell up to 4¾ inches high.

Full information on this press may be obtained by addressing the makers on your letterhead, mentioning The BLUE BOOK.

The New "Shorty" Ball Bearing Electric Drill



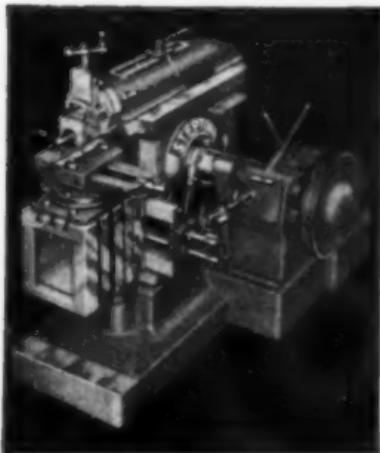
Increased application of power drills to small-unit production and assembly operations demands a drill combining ample power, compact design, light weight and the ability to work around corners.

Black & Decker's new "Shorty" is offered to meet these varied requirements and presents a number of interesting new features.

Chuck spindle is mounted at right angles to the motor, which is said to reduce overall working length

(Continued on Page 58)

POWERFUL MACHINES for HEAVY WORK



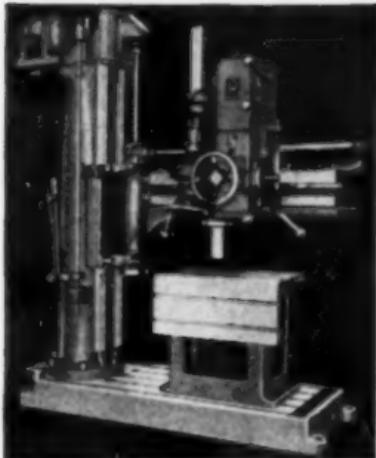
STEPTOE SHAPERS

Force feed continuous lubrication, heavy construction and Timken bearings throughout insure rigidity, accuracy and long life. Centralized controls are within easy reach of the operator at all times.

Instantaneous feed and speed changes may be made with fingertip control while the machine is running.

Send today for catalog No. 130.

WESTERN 12-SPEED RADIAL DRILL



Twelve geared spindle speeds of 40 to 2000 r. p. m. adapt this solidly-built, easily-controlled drill to small drilling and tapping jobs as well as to heavy-duty milling and spot-facing operations.

Simple, centralized controls within easy reach of the operator, ball bearings throughout, instantaneous speed and feed changes and easy swinging head make accuracy a commonplace.

Twin disc clutches, 6 geared feeds and elevating mechanism fully enclosed and running in oil contribute to easy, dependable operation.

Write today for your copy of the 12-page circular illustrating features of the Western drill that will save money in your plant.

Western Machine Tool Works
HOLLAND, MI **MICHIGAN**

of the tool to 4½ inches. Motor housing dimensions have also been reduced to a minimum so the tool fits snugly in the operator's hand and requires no extra handle.

The unit is ball bearing throughout and has a universal motor operating on A.C. or D.C. Removable insulated cap furnishes easy access for brush inspection. Thumb control switch is in the line just back of tool.

"Shorty" is said to be especially adapted for close corner work in aircraft and auto trim plants; radio and other cabinet work; ornamental iron and structural steel work, and as a compact kit tool where size and weight are important considerations.

Available in either 3/16 or 1/4 inch capacity, the equipment includes 3-conductor cable and plug; switch; Jacobs geared chuck and key. Standard voltage is 110 but "Shorty" can also be supplied for operation on 220 or 250 volts.

Write direct on your business letterhead to Black & Decker Mfg. Co., Towson, Md., for complete information, mentioning The BLUE BOOK.

Kwick-Cote Solution for Die Lay-out Work

Kwick-Cote is a chemical compound that deposits a copper plating on any metal by dipping or painting on. Markings on the thin layer of copper plate are said to be long-lasting, clear and distinct, making it easy for the worker to follow his pattern.

Kwick-Cote was originally developed as a method of lowering costs of plating where selective hardening was necessary, and it is asserted that hair line separation of hardness can be obtained with positive results. Preparation for hardening requires but a few minutes, as the solution is quick-drying and the parts can be placed in the carburizing pots immediately. It is claimed that parts treated with Kwick-Cote may be kept dead soft while the rest of the piece is hardened. It is recommended for use between cams, back of gears, threads, in bores where stock is left for reaming after heat treating, on springs and any section that is to remain soft.

Complete information on Kwick-Cote and its uses may be obtained from Grapho Products, Inc., 2232 Alvord St., Indianapolis. Address them on your business letterhead, mentioning The BLUE BOOK.

Are You "UP" on STANDARD'S DIAL BORE GAGE?



UTILITY—Developed to meet the demand for accurate checking of bore dimensions in quantity production and individual pieces.

WIDE RANGE—only seven gages are required to cover the whole wide range from 1" to 12 $\frac{1}{2}$ ".

ADAPTABILITY—Unique construction enables measurements to be made within $\frac{1}{4}$ " from the bottom of blind bores—applicable to holes with obstructions such as shoulders, webs, undercuts, etc. Extensions are available for deep bores.

RAPID PRECISION—Setting requires only a few minutes. The Dial Indicator is graduated in .0001" and enables operator to estimate within .000025".

CORRECT PRINCIPLE—is used in that measurements are taken diametrically through the center of bore. Two centralizing plungers, one on either side of live gaging member, automatically keep gaging points true with centerline of bore.



"For better gaging come to Standard"

*Quickmail Coupon No. 38 will bring
new free catalog of the complete
line of Standard Production Gages.*

STANDARD GAGE CO., INC.
POUGHKEEPSIE * NEW YORK

New Packaging for Putnam

The Putnam Tool Company, Detroit, have just introduced a new type of packaging for their products. It is to be used for all Putnam Tools with the exception of the largest sizes.

Each tool is first wrapped in heavy waxed paper and then enclosed in a sturdy, specially designed carton with a sliding feature which eliminates end flaps and any possibility of accidental opening of the box. Neither moisture or rough handling can impair the serviceability of the tool before it is ready for use.

The use of the new carton also permits a compact and more convenient method of stocking Putnam Tools. The size and style of each tool is plainly marked on the end of the carton permitting immediate identification.



Progressive Hydraulic Self Stripping Punching Units

The makers of the new punching unit illustrated below emphasize that stock individual punching units may be used in any set-up or built into production fixtures by the manufacturer to his own specifications.

The units vary in size from $1\frac{1}{2}$ " to 4" cylinder diameter, referring to the center piston. Pressures vary from 2650 lbs. in the $1\frac{1}{2}$ " diameter to 19,000 lbs. in the 4" diameter, and cylinder length from 8 to

(Continued on Page 62)

ANNOUNCING

OUR NEW GENERAL CATALOG



Presenting money-saving values on more than 10,000 milling cutters and tools of best makes — all guaranteed to render complete satisfaction with our money-back warranty. Send for your copy.

Quickmail Coupon No. 62 will bring you this catalog

MACHINISTS TOOL SUPPLY CO.
3040 W. Van Buren St., : : CHICAGO

TOOL RECLAIMING TOOL SHARPENING

Special Tools made to your blueprints

**We have unusual facilities for production
grinding of machine parts**

Centerless Grinding

Let us solve your grinding problems

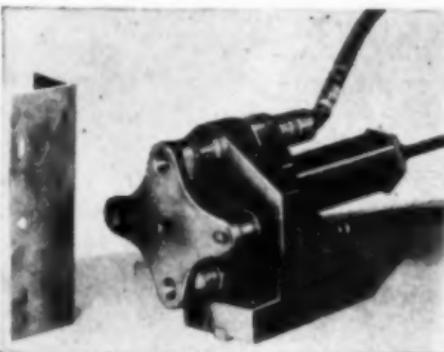
Write Us TODAY

MACHINISTS TOOL GRINDING CO.
3038 W. Van Buren St., : : CHICAGO

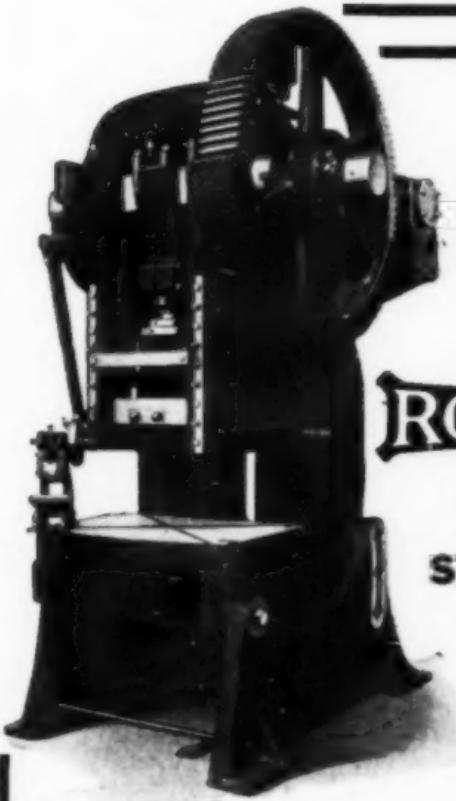
10" correspondingly. The 1½ stroke is standard for all sizes, but units with longer stroke can be supplied. Stripper cylinder diameter varies from ¾" in the 1½" model to 1" in the 4" model. Travel is ¾" on all types.

The hollow stripper cylinder serves as a guide pin for the punches, and the exterior is hardened and ground for wear and alignment. A working area approximately 8" in diameter may be covered with each unit and as many punches can be mounted as space allows, and capacity and size of the cylinder permits. Standard punches and dies are used which can be mounted on the heads in any location, and are said to be as interchangeable on different jobs as the cylinders themselves.

Units can be operated singly, in multiple or alternately according to the control. Any reversing type of hydraulic valve is suitable. In operation, the stripper first positions the work against the die, and reversing the valve, the punch follows through piercing the holes, which is said to assure clean, accurate work. The punching unit may also be used for embossing or trimming on light gauge sheet metal work. Relocation and changing of the punches is all that is necessary for any production change. Electrically driven hydraulic pumps supply pressure of approximately 1500 lbs. per square inch, maximum. Any type of hydraulic pressure unit will operate these punches.



However, Progressive offers one especially engineered for the purpose. It may be used on other set-ups requiring hydraulic pressure. Operating valves are also stocked, and if special high production fixtures are required, Progressive Welder Co., can design and provide fixtures for any set-up using these standard punching units and accessories. Full information may be obtained by writing them at 737 Piquette Ave., Detroit, Mich., preferably on your business letterhead.



Built for
EXCEPTIONAL
SERVICE

ROCKFORD

**INCLINABLE
AND
STRAIGHT SIDE
PRESSES**

in all
sizes

THE ever increasing use of heavy sheet metal stampings nowadays in place of castings and the numerous parts formerly made on screw machines, requires presses of greater power and capacity, and that's just what you get in the **ROCKFORD**.

Rockford Presses are sturdily built of the best materials and incorporate many features that are the result of years of experience in building presses of various types. You can depend upon a Rockford—for it is designed to maintain exact adjustment throughout long runs and under heavy duty.

Write for Catalog

ROCKFORD IRON WORKS
ROCKFORD, ILLINOIS

Three New Chaser Grinders By Landis

The Landis Machine Co., Waynesboro, Pa., offer a trio of new chaser grinder models covering the entire range of Landis chasers.

Model O is a small machine designed primarily for grinding Landis chasers for the smaller sizes of die heads. Its small size adapts it for departmental use where a number of Landis die heads are used.

The No. 1 grinder is a heavier duty machine for chasers up to $1\frac{1}{8}$ " wide, being especially intended for tool room production grinding.

No. $1\frac{1}{2}$ grinder is an extra-heavy duty machine offered for grinding the largest Landis chasers under severe production conditions. This model is the only one of the trio with means provided for the use of a coolant on the cup wheel. A centrifugal pump, gear driven directly from the armature shaft, and located inside bed of the machine, provides a steady flow of coolant.

A traversing table at the cup wheel end is also furnished exclusively on the model $1\frac{1}{2}$. The other models use a new method for infeeding the chaser and passing it back and forth across the face of the wheel. The chaser is gripped for grinding in a swivel mounted on a cylindrical base. The latter operates on a spindle end and is fitted with a long handle by which it may be swung in an arc parallel to the wheel. A feed screw is provided through the spindle to infeed or withdraw the swivel head. The spindle and feed screw are completely covered by a sliding bushing to exclude dirt and grit. An adjustable stop is also provided for limiting the length of travel of the swivel head parallel to the wheel. Although the usual practice is to grind the lip rake angle of Landis chasers by



(Continued on Page 66)

INCREASE PRODUCTION WITH FEDERAL PRESSES



No. 33 BACK GEARED

Capacity 26 tons
Large area ram face
Large bolster plate
Large opening thru
back for bulky work

Designed and built es-
pecially for large or
bulky light work and
for progressive dies such
as used in lamination.

All models of FEDERAL heavy duty presses are equipped with Timken bearings to increase efficiency and production at the lowest possible upkeep cost. Roller bearings in the flywheel are adjustable for wear, eliminating the need for expensive rebuilding and repairs after long use and preventing damage to the clutch and control mechanism. Non-repeat safety type clutch and tripping device, also standard equipment on FEDERAL models, guard against accidents to operators or dies should momentum carry the crank-shaft beyond center.

**F E D E R A L
P R E S S C O.
E L K H A R T , I N D .**

Send Coupon No. 65
for illustrated in-
formative circular

hand on the straight wheel, it is now possible to grind this angle on the cup wheel, if desired.

A new type of swivel head provides a chaser clamping screw contacting the chaser on the dovetail surfaces like the chaser clamp on a die head. This affords a rigid and secure support for the chaser and assures accuracy of the lead and rake angles. The swivel head is graduated so that any degree of rake and lead angle may be obtained.

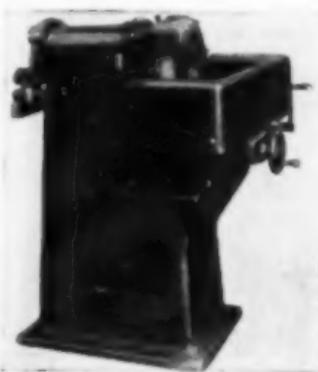
Grinding wheels are mounted directly on the armature shafts of the motors. A cup and a straight wheel are supplied as standard equipment. The straight wheels are used for grinding rake angles of bolt chasers where a lead screw is not used. This operation is facilitated by an adjustable rest. The straight wheel may also be used for miscellaneous grinding. The cup wheel is used for grinding lead and rake angles of all pipe chasers and bolt chasers when thread is to be cut with the use of a lead screw.

Although a grinder is not absolutely essential to the proper operation of a die head, the makers point out that the accuracy with which chasers are ground will be reflected in the quality of thread produced with the die head, and in the life of the chaser.

Write the manufacturers on your letterhead, mentioning The BLUE BOOK for full information on these machines or other Landis equipment.

British Firm Wants American Lines

The Acorn Machine Tool Co. (1936), Ltd., Devonshire Works, Duke's Avenue, Cheswick, London, W-4, England, write that they want to represent manufacturers of machine tools and engineering small tools. They are now representing six American manufacturers of machine tools and shop equipment, for whom they say they are doing a fine business. If interested, please write to the Company, attention of Mr. M. Barlow, Director.



Sure!

You COULD
Mail It Up
With A Sledge



It's just as inconsistent to continue handling small jobs on big presses. You can effect savings on small work with a

ROUSSELLE PUNCH PRESS

that would be impossible with a large press. And you can buy a Rouselle Press at an unbelievably low price — \$100, less motor and stand. Stand, \$15 extra. It's the only inclinable press at this price. With automatic feed, 10,000 operations per hour are possible. Many attractive modern features include non-repeating clutch (pat. app. for) which stops after each stroke regardless of foot pedal position unless pin is removed, where-upon it will run continuously so long as pedal is depressed.

Quickmail Coupon No. 21 will speedily bring you complete information.

DAVID J. ROSS CO.,

**BENTON HARBOR,
MICHIGAN**

A New L-W Full Universal Dividing Head

L. W. Chuck Co., Toledo, Ohio, emphasize that a wide variety of indexing and spiral cutting can be handled with their new 10½ inch full universal dividing head (actual swing 11 inches) index centers for universal milling machines.

The swivel head stock is graduated up to 180 degrees and may be tilted above and below the vertical and perpendicular lines.

The worm is accurately cut, hardened and ground



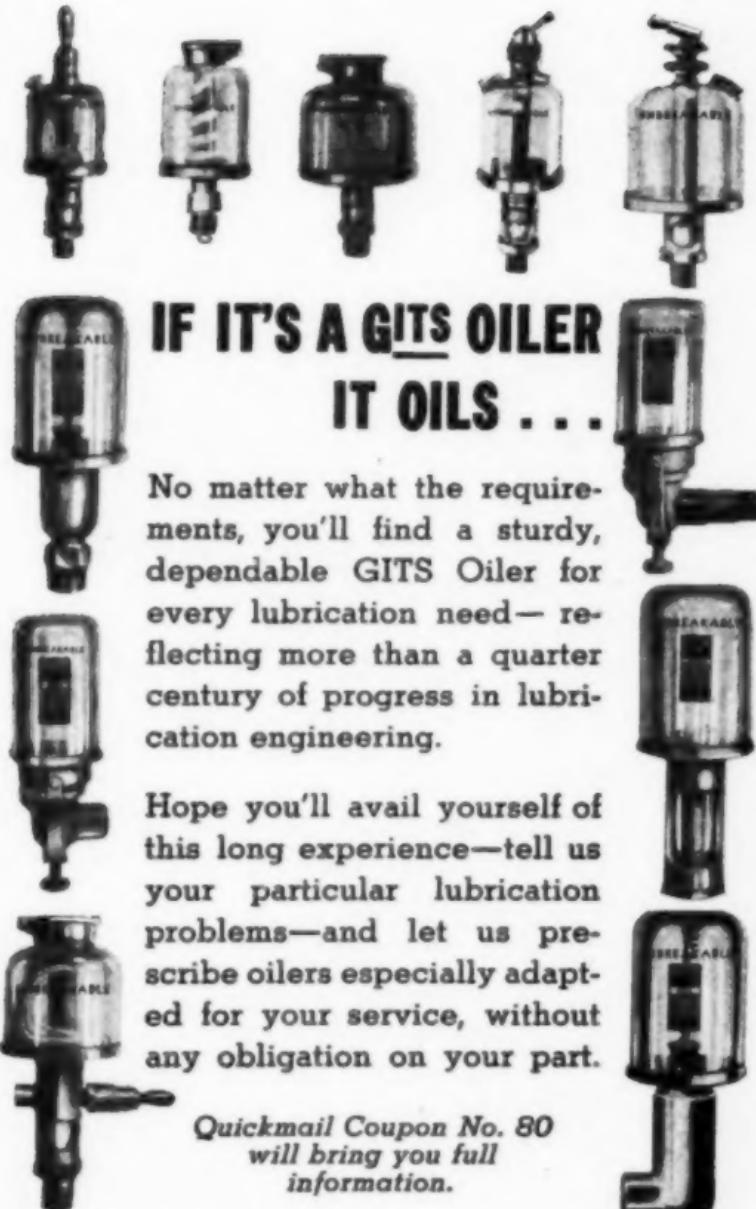
and adjustable for wear and take-up through an eccentric bushing. It is easily disengaged by a simple movement and locking device.

Worm wheel ratio is 40:1. It is keyed to the spindle, assuring positive movement when engaged by the worm.

Rear end of spindle has No. 10 B & S Taper. Tapered bearing and thrust collar is provided to take up end thrust. Spindle thread is $2\frac{1}{4}$ inch diameter, 10 thread.

Equipment includes $\frac{5}{8}$ inch table slot tongues; three index plates giving all divisions obtainable up to 380 and chart explaining same; set of change gears; quadrant idler bushings. A spindle arbor for differential indexing can be furnished at extra cost.

The device weighs 180 pounds packed for shipment, and can be furnished either right or left hand. Full details may be obtained by writing the makers on your business letterhead using Quickmail Coupon No. 36.



IF IT'S A GITS OILER IT OILS . . .

No matter what the requirements, you'll find a sturdy, dependable GITS Oiler for every lubrication need—reflecting more than a quarter century of progress in lubrication engineering.

Hope you'll avail yourself of this long experience—tell us your particular lubrication problems—and let us prescribe oilers especially adapted for your service, without any obligation on your part.

*Quickmail Coupon No. 80
will bring you full
information.*

GITS BROS. MFG. CO.

1857 South Kilbourn Avenue,

CHICAGO, ILLS.

Scherr Introduces New Taylor Scroll Chuck

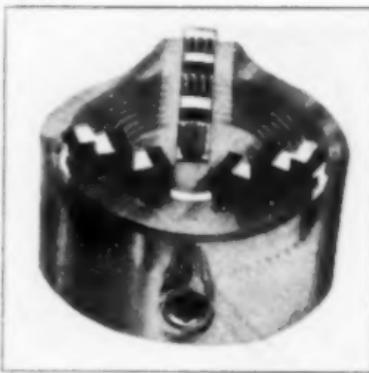
In plants where tungsten carbide cutting tools are used, it is especially important that the work be held firmly without chance of slipping in the chuck, otherwise the tools are endangered. The new Taylor self-centering scroll chucks are asserted to be particularly well adapted for this service, with double the gripping power of the ordinary scroll chuck.

The chuck body is of special high tensile cast iron with a face in the form of a hollow cone. Jaws slide in ways cut in this face. The back retains the internal working parts in position and contains a recess for the adapter.

The spiral is of hardened, ground steel. It has teeth in the back and is revolved by any one of the three pinions. The face has a spiral V thread engaging the teeth cut in back of the jaws, advancing or withdrawing the jaws simultaneously and gripping the work true without setting. The jaws are supported immediately behind and at right angles to the line of pressure caused through gripping the work. This is said to give great rigidity and strength, preventing stripping or bending of the teeth at back of the jaws or tearing-out of the jaw ways in the chuck body. Further, this construction is said to enable hardening of the important working parts.

The jaws are hardened all over and ground true on the parts which slide in the chuck body, and also in position on the parts which grip the work. Two types of jaws are usually supplied—one for general lathe work and the other for holding bars, etc.

Soft jaw blanks are also available for holding odd shapes of work. These are interchangeable with standard jaws. The front part is left soft for machining out to hold the desired work while the teeth at the back are hardened. Parts which slide in the chuck



(Continued on Page 72)

WITTEK

AUTOMATIC
Roll Feeds

For Every Size and Make of Punch Press



**FAST
ACCURATE
AUTOMATIC
SAFE**

Increases Punch Press Production

Keeps production at the same steady high level day in and day out—no fatigue or other human "let down". Easily installed on any press without alteration. Feeds automatically any stock from coils in lengths from 0° to 24° per press stroke. Saves time, operating costs and dies—reduces scrap to a minimum. A type for every requirement—Single Roll, Double Roll, and Compound with straightener.

Wittek Reel Stands

Automatic, Self - Centering Ball - Bearing. Adjustable to any height, balanced at any angle, 500 lb. capacity. Prompt deliveries from stock. Also made in four other models.

Write Today for Bulletin "HF" giving complete details and specifications of WITTEK Automatic Roll Feeds and Reel Stands.

USE QUICKMAIL COUPON No. 25



WITTEK MANUFACTURING COMPANY

4305-9 W. 24TH PLACE

CHICAGO, ILL.

body are hardened and ground the same as standard jaws.

The bevel pinions for revolving the spiral are of chrome nickel steel with teeth of strong design. They are electrically heat treated, ground and tested before assembly.

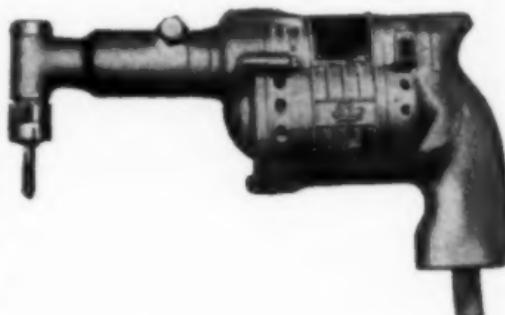
Full information may be obtained by addressing George Scherr Co., 128 Lafayette St., New York.

A New Thor Right Angle Drill

This latest addition to the Thor line, known as U14R $\frac{1}{8}$ and $\frac{1}{4}$ inch capacity, weighs but three pounds and is $9\frac{1}{4}$ inches overall, adapting it for one-hand operation.

It is said to have a possible working clearance of only $2\frac{3}{8}$ inches. The drill head measures $2\frac{1}{8}$ inches overall and the angle attachment can be turned and clamped in any position, which is said to make it possible to drill in places formerly considered inaccessible.

A wide drilling range is covered with the $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$ and $\frac{3}{8}$ inch collets for twist drills. Can also be supplied with spindle to take a $\frac{1}{8}$ inch chuck. The spindle offset is $\frac{1}{2}$.



Standard operating speed is 2700 r.p.m. The U13R model is available for 3750 r.p.m., and U15R for 5100 r.p.m.

Interesting construction features include a triple-insulated hand-wound armature, commutator built on brass sleeve to eliminate high bars and floating segments, alloy steel, spiral helical gears and radial vent cooling system.

For further information write to the Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago, preferably on your letterhead mentioning The BLUE BOOK.

INCREASED
PRODUCTION RESULTS
FROM USING

LITTELL



AUTOMATIC
CENTERING
REELS

Three Sizes

Plain or motor driven—
No. 3 for 300-lb.
coils—
No. 5 for 600-lb.
coils—
No. 10 for 1000-lb.
coils.

Ask for Circular

STEP up production with the Littell Automatic Centering Reel. With it one man can load and center heavy coils within a few minutes. Ball bearings permit easy turning of centered coils and increase output with either hand or automatic feeding.

Other Littell Products include Automatic Roll Feeds, also Punch Press Air Valves and Universal Air Nozzles.

Use Quickmail Coupon No. 41 in
requesting Littell circulars.

F.J. LITTELL MACHINE CO.
4153 Ravenswood Ave., CHICAGO, ILL.

The "Alnor" Electronic Pyrometer Controller

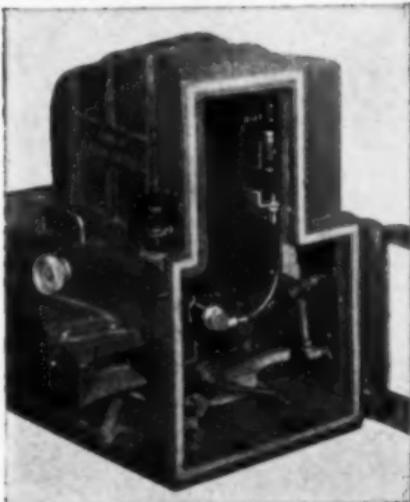
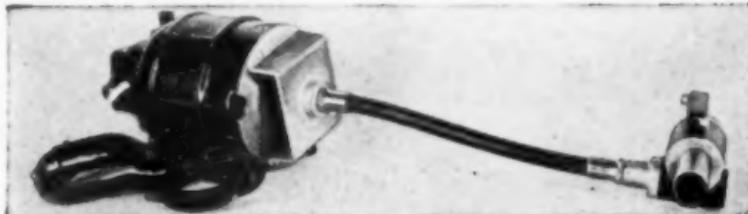
Illinois Testing Laboratories, Inc., 420 N. La Salle St., Chicago, announce their new "Alnor" pyrometer controller for automatically controlling temperatures of heat treating furnaces, melting pots or other heating devices at a definite predetermined point.



Operation is described as electronic, similar to a radio circuit. The pointer of the indicating pyrometer carries a small vane. An adjustable target is provided, carrying two condenser plates or vanes, forming the capacitive element of a tuned circuit. The circuit remains unchanged except at the point where the indicating pointer and target coincide. When the vane of the temperature pointer approaches the temperature setting, the vanes of the pointer and target

(Continued on Page 76)

Consider this simple motor drive combination



Motor drive combination as used in sound picture camera. Photo courtesy of manufacturer, Northern Electric Co., Ltd., Montreal, Canada.



The combination of motor, flexible shaft and simple gearing is one that designing engineers should bear in mind. It permits free scope to location of parts and does away with the need for accurate alignment.

It has an extensive field of application because S. S. WHITE Shafts are available in a wide range of diameters and physical characteristics.

We'll be glad to help you work out details of any specific application, including selection of the proper shaft for the job. No obligation—Send us the details.

The S. S. WHITE Dental Mfg. Co. INDUSTRIAL DIVISION

10 East 40th St., Room 2310-H, New York, N. Y.

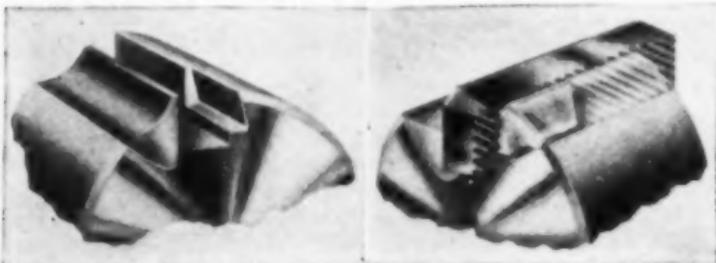
interleave producing a circuit change which operates a relay. The heating current, if electric, is shut-off or in case of fuel fired operation the fuel valve is closed partially or completely, depending on the type of valve used.

Neither motor nor depressor bar is used in the Alnor controller nor is there any direct contact between the vanes. The temperature indicating pointer is free to give continuous indication and control. A red bull's eye indicates whether the heat in the furnace is on or off.

All circuit elements are operated considerably under the rating to prevent early deterioration. The vacuum tube voltages are maintained well below the manufacturer's limits to give extended life. In the event of a tube burnout the furnace is automatically shut off.

Gair-Lock Cutter Blades

A new method of locking inserted blades, developed by the Gairing Tool Co., Inc., Detroit, Mich., and intended to provide a wide range and easy adjustment for inserted blades in milling cutter heads, may be applied to all multiple-blade cutting tools including boring bars, boring heads and reamers. The locking member in a shouldered recess adjacent to the blade slot fits the serrated blade and locks it. Blade and lock are inserted lengthwise.



Adjustment is simple, as there are no wedges to drift out or upset. Blades may be released by a tap on the rear and they may be set out the required distance. Individual blades may be removed and replaced without disturbing any other blades in the cutter head. Rigidity and easy setting of the blades

(Continued on Page 78)

TOOL TROUBLES VANISH

When
OLIVER
Machines
Are
Installed

Many production failures are traceable to incorrect reconditioning of cutting tools. Only properly ground tools will keep your high production machines "on their toes". Oliver grinders will eliminate tool failures in your plant as users the country over will testify. Machines available for all standard and many special tool grinding operations.

THE **OLIVER** LINE

Face Mill Grinders,
Twist Drill
Grinders,
Tap Grinders,
Die Making
Machines,
Cutter Grinders,
Precision Tool
Grinders.



OLIVER DRILL POINTERS

The cut illustrates the Oliver patented Drill Grinder; a machine that generates correct lip form on the drill in one operation. Grinds the patented Oliver drill point. Assures greater number of holes per grind, saves on drill costs, spoiled work, etc.

Send Quickmail Coupon No. 17 for complete information on this machine—and the rest of the Oliver line of Tool Reconditioning Equipment.

OLIVER INSTRUMENT COMPANY
1408 E. Maumee St., ADRIAN, MICHIGAN

at the correct angle and rake are claimed for this new construction.

The new design is intended to prevent blade shifting or tilting—to permit installation of more blades—closer tooth spacing—to avoid special bodies for tungsten carbide blades—to prevent chip interference at face of blades and to allow interchangeability of blades. No auxiliary pins, screws, collars or wrenches are required to position the blades.

Fafnir Completes Range of Self-Aligning Bearings

The Fafnir Bearing Co., New Britain, Conn., now offers three distinct types of self-aligning ball bearings in a full range of sizes. Wherever this style of bearing is necessary, it is affirmed that Fafnir offers a self-aligning construction to meet every normal requirement.

In the "B" type bearing the conventional outer ring is made with the outside surface spherical instead of cylindrical. A concave inner surface in the housing corresponding to the convex outer surface of the ring permits the bearing to swivel into true alignment with the shaft.

Type "S" permits retaining the conventional cylindrical inner surface of the housing by providing an extra self-aligning ring with a concave inner surface. This extra ring surrounds the spherically ground outer bearing ring proper to form the alignment socket. The advantages claimed are:—Simple, straight bore housing; easy mounting similar to ordinary radial bearings; and ring-to-ring contact with no movement against the housing.

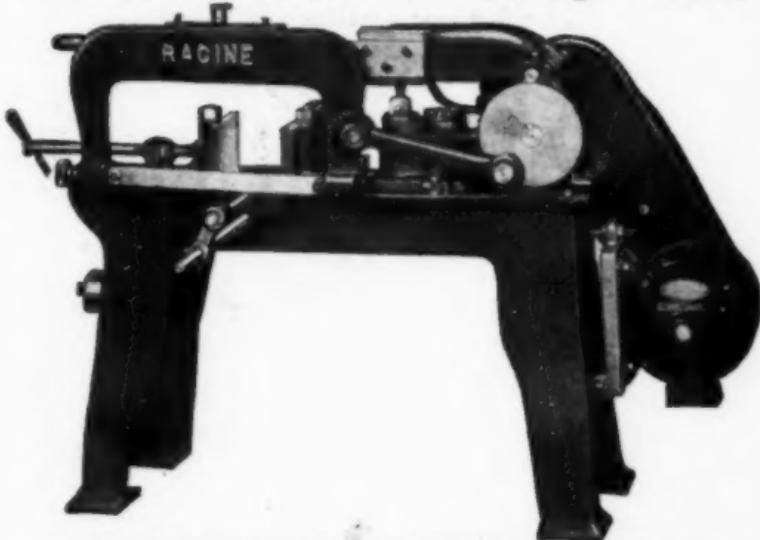
The "L" type gives self-alignment entirely from within the outer bearing ring, permitting housing to be both straight-bored and of minimum diameter. A double row of balls is used in all "L" type bearings, including single row widths. The two rows of balls, tracked by two races on the inner ring are left free to locate themselves in one spherical race on the outer ring. Here, the balls themselves roll the inner ring and shaft into alignment.

These Fafnir self-aligning bearings are available in single row and double row types, and also in the wide inner ring type. Further information may be had by writing to the manufacturers.

RACINE

ANNOUNCING

The New RACINE "Utility" SAW



SIMPLIFIED HYDRAULIC FEED—MODERN DESIGN

A machine for the small shop or as auxiliary equipment in the large shop. The price is very moderate. Here is an ideal 6"x6" machine that has everything—

Accuracy in cutting

Freedom from complications

Rapidity in production

Modern simple lines

Long blade life

The hydraulic principle, simplified and engineered by pioneers in the application of hydraulics to metal cutting machines.

Send Quickmail Coupon No. 47 for descriptive literature. RACINE dealers everywhere will gladly tell you about this remarkable, new, low priced RACINE machine.

(Also hydraulic feed heavy duty machines,

10x10", 12x12", 10x16" and 13x16" capacities.)

(RACINE Shear Cut, Screw Feed, Production Saws, 6"x6", 8"x9".)

(RACINE Duplex Band Saws, 14"—for Metal-Cutting, Tool Room, Pattern Shops and General Shop Work.)

"STANDARD THE WORLD OVER"

RACINE TOOL & MACHINE COMPANY

1754 STATE STREET

RACINE, WISCONSIN

Gray Nibbler Has New Features

A new No. 4-A, 24" throat, $\frac{3}{8}$ " capacity turret head metal cutter or nibbler is announced by the Gray Machine Co., Box 596, Philadelphia, Pa. It is explained that by use of the turret, shapes may be cut in sheets or plates of any length and twice the throat depth of the machine by changing the direction of the feed with the turret while cutting. Further, the twin strippers are individually adjustable so that one may be stripping on the templet while the other is stripping on the stock at a lower level, giving balanced stripping on both sides of the tool when cutting by master templet.

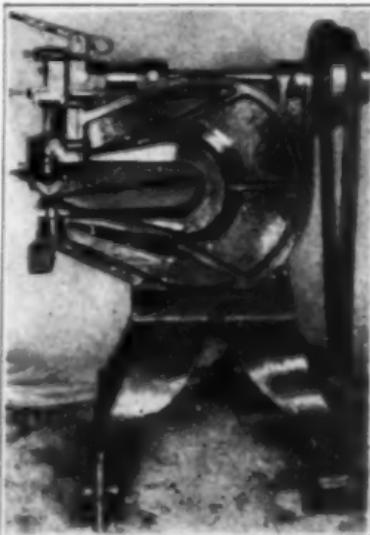
Another interesting feature is the cutting tool, which allows ample space between the bite and the pilot for the spread of slugs that would otherwise endanger the cutting tool.

A gag mechanism is also provided which automatically drops in place and starts the cutting action when the top hand lever is depressed. When the gag is drawn to the front of the machine this stops the action of the tool and the machine continues running.

A two speed pulley makes available the operating speeds of 450 and 800 r.p.m., and a floating motor base absorbs driving shocks and vibration.

The eccentric for operating the cutting tool is interchangeable, permitting conversion of the nibbling machine into a high speed shear which will shear in all directions without turning the stock.

Complete information on this new unit, as well as other types of Gray metal cutters will be sent you by the manufacturer on application.



DOALL CONTOUR SAWING FILING and POLISHING

ECKSTROM CARLSON
& COMPANY of Rockford
filing inside of large die



19
DOALLS
are in
operation
in
Rockford,
Ill.



METALMASTER

Send for FREE
Case Record Book
describing methods
that CUT COSTS



**CONTINENTAL MACHINE
SPECIALTIES, INC.**
1301 South Washington
Minneapolis, Minnesota

Use Quickmail Coupon No. 65

Hardinge Bench Lathe with Transitorq Drive

From the very beginning, bench lathes were provided with some means of changing speeds. Countershafts and gear boxes were first used. Later, Hardinge applied the two-speed motor principle. Now the Hardinge combination of a two-speed motor with transitorq variable speed drive incorporates new and retains old features for proper bench lathe operation.



The new drive unit is said to have been in development and use for 20 months. During this time Hardinge has made tests and changes, working with the New Departure Mfg. Co., in the development of a transitorq particularly adapted for bench lathe use.

The transitorq provides a range of 1:10 ratio between low and high speeds. The two-speed reversible motor has a 1:2 ratio giving the spindle a double speed range of 1:20 or 150 r.p.m. and intermediate speeds to 3000 r.p.m.

While the transitorq hand wheel, it is explained,

(Continued on Page 84)

FORMERLY manufactured by Rockford Machine Tool Co., of Rockford, Ill., thousands of these drills have been installed in plants the country over, where they have been giving universal satisfaction.

Counterbalanced, eight-speed spindle, made from high carbon special steel, has quick advance and return; positive feeds are instantly available while machine is in operation; all controls within easy reach.

DRILLING MACHINES



21'-23'
Stationary Head

* * *
24'-28'
Sliding Head

* * *
Belt or Motor Drive

POWERFUL—SIMPLE— DURABLE—ACCURATE

We have been builders of Drilling Equipment for more than 20 years and, in addition to the above drills, manufacture the Cleereman Automatically Oiled, Anti-Friction, High Speed Drilling, Boring and Tapping Machines; Gang Drills and Special Drilling Machinery.

CLEEREMAN MACHINE TOOL CO.
GREEN BAY, WISCONSIN

(Formerly Green Bay Barker Machine Tool Works)

gives a speed variance from 150 to 3000 r.p.m., the Hardinge two-speed motor, it is claimed, gives other advantages. With the transitorq hand wheel set for 1000 r.p.m., changing lever from Low to High position immediately alters the speed to 2000 r.p.m. or vice versa. In other words, there are two immediate speeds in every position of the transitorq, which saves time as it obviates slow turning of the hand wheel to get any Low-High or High-Low speed change.

The long lever gives Low-Stop-High speed change. The short lever provides Reverse-Brake-Stop-Forward changes. The accompanying illustrations show a close-up of the headstock with transitorq control and an underneath view presenting details of the new drive.

The transitorq and motor are placed to the rear and out of the way of the operator's knees. The mounting is completely rubber insulated to absorb vibration. Provision is made for quick and easy adjustment of the belts.

Hardinge Bench

Lathes are offered in five sizes, $\frac{1}{2}$ to 1 inch collet capacity, 7 or 9 inch swing and full information is available in an 8-page bulletin, while an additional 16-page bulletin covers useful attachments.

Address Hardinge Bros., Inc., Elmira, N. Y., for any information desired.



Strippit Issues Bulletin A

An interesting new 8-page bulletin has been published by The Strippit Corp., 1559 Niagara St., Buffalo, N. Y. Illustrations and descriptions are presented of the various Wales notching and punching dies and stripping units, giving a clear insight into their construction and use on representative jobs. Write direct to them for your copy of this bulletin.

Good Equipment Costs Less —

When you figure REAL cost

Milling Machines

Grinding Machines

Screw Machines

Machinists' Tools

Cutters and Hobs

Pumps

Misc. Shop Equip.



Have you our general catalog
No. 140? A copy gladly
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Sharpe Mfg. Co., Providence,
R. I., U. S. A.

BROWN & SHARPE

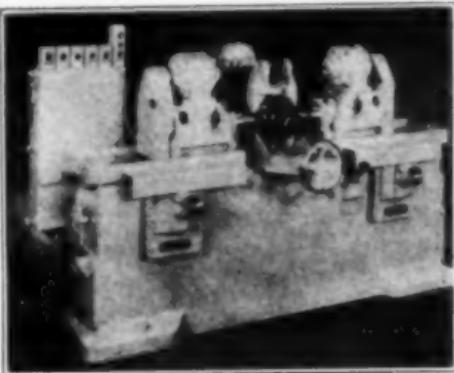
Excello Adds New Line of Multiple Boring Machines

Excello Corp., Detroit, Mich., announces an entirely new line of high production, high speed, multiple boring, facing and turning machines, comprising both 2 and 3-way types with from 2 to 9 boring spindles.

It is claimed that on parts requiring boring, turning or facing operations from more than one direction, these machines eliminate the chance of error that might arise from locating parts in separate fixtures on different machines for individual machining operations. For parts requiring operations from one side only, it is said that multiple fixtures provide higher productivity per machine hour. Compactness is a noticeable feature of these highly flexible units.

On the 3-way machines it will be noted that the boring spindles with their individual motor drives are separately mounted on sliding tables. Table feed is by the Ex-Cell-O hydraulic system with individual hydraulic pumps for each table.

The spindles are standard Ex-Cell-O precision ball bearing mounted in special heads for compactness and so designed that extra spindles may be provided in addition to those shown.



Cutting cycles are completely automatic. Micrometer adjustment dogs are provided for each table for setting the distances for fast approach, cutting, dwell and fast return. Dwell period at the end of the cutting stroke is separately adjustable for anything from one to 30 seconds to insure the desired finish characteristics with minimum time per operation.

(Continued on Page 88)

END MILLS

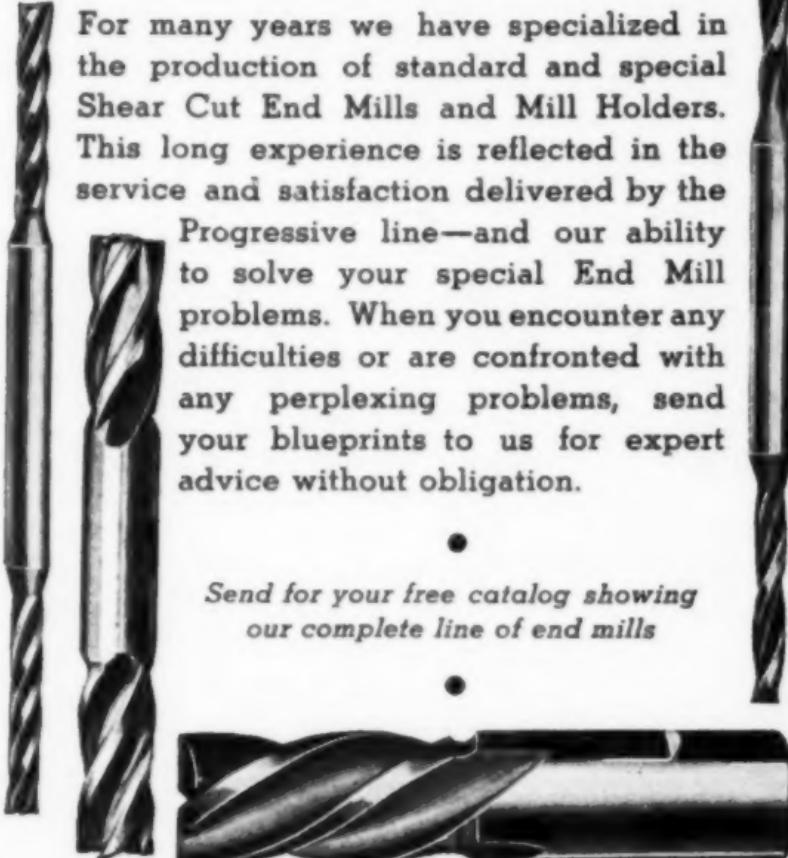
for All Purposes

SHEAR CUT END MILLS

For many years we have specialized in the production of standard and special Shear Cut End Mills and Mill Holders. This long experience is reflected in the service and satisfaction delivered by the

Progressive line—and our ability to solve your special End Mill problems. When you encounter any difficulties or are confronted with any perplexing problems, send your blueprints to us for expert advice without obligation.

Send for your free catalog showing
our complete line of end mills



PROGRESSIVE TOOL & CUTTER CO.
FERNDALE, MICHIGAN

HIGH SPEED

Spindle speeds are constant for any particular job, designed for a cutting speed around 400 feet per minute with carbide cutting tools for which these units are especially adapted. Feeds may be varied from 0 to 42 inches per minute, for any materials as well as types of work and character of finish required. If high speed cutting steels are to be used, lower spindle speeds are provided.

The control panel provides individual starting controls of the push button type, for the motors operating spindles and pumps, with two additional buttons permitting simultaneous starting and stopping of all motors.

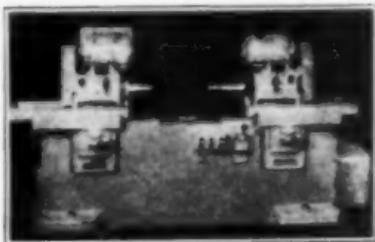
The machines shown are equipped for dry cutting. A sump in the base, however, permits installation of a coolant system, for which the pump is driven off one of the hydraulic control pump units.

Spindles are universally adjustable, vertically, axially as well as transversely. Holes from $\frac{3}{8}$ up to 6 inches in diameter may be bored. Maximum table travel is 12 inches. A fixture pad 15x15 inches provides ample support for large fixtures. Return speed and rapid approach is 11 feet per minute.

The 2-way type is similar in design to the 3-way model. Two hydraulic pumps are provided at rear of the base. Like the 3-way, this model is adaptable to a wide variety of multiple boring, facing and turning operations. Cutting operations may be simultaneous from both sides or alternately as desired. The machine may be used for 2-way machining of a single part, requiring counterboring for instance, or for simultaneous or alternate machining of separate parts—cutting one while loading the other.

For continuous production, the 2-way type can be provided with a vertical or horizontal multi-station, rotary indexing fixture permitting performance of a multiplicity of boring, turning and facing operations.

When you send for further information on these machines, just stick Quickmail Coupon No. 63 on an envelope and enclose your signed business letterhead.



HIGH SPEED TAPPING ATTACHMENTS FEATURING THE PROCUNIER



CLUTCH—

Double-cone, cork-faced friction clutch. Sensitive. Powerful. Practically indestructible.

BALL BEARINGS —

afford rigidity, accuracy and long life.

REVERSE—

speed twice forward speed through patented three-point balanced heat treated gear reversing mechanism. Less strain.

"TRU-GRIP"—collet type tap holder. Smallest and lightest of its kind. Most accurate and practical tap holder that ever held a tap.

PROCUNIER style "E" high speed tapping heads will cut your tapping costs. *Write for new folder.*

Use Quickmail Coupon No. 13

PROCUNIER SAFETY CHUCK CO.
14 S. CLINTON ST., **CHICAGO, ILL.**

The New Furnas Pressure Switches

Furnas Electric Co., West Allis, Wis., announce their Style H Pressure Switches for water systems and air compressors, for 2 and 5 h.p. motors.

Four standard pressure ranges are available, the maximum cut-out pressures being 20, 50, 125 and 200 lbs. These four ranges together with the low differential adjustment give a range of pressures for almost every condition. The 125 and 200-lb. range switches have a standard diaphragm. The 20 and 50-lb. range types have extension diaphragms.

The switches are pleasing in appearance, and considering their capacity, very compact. A double compression spring arrangement permits this small size and is said to make for a better balance of spring arrangement.

The operating mechanism is a unit assembly, secured inside of the case, assuring rigidity and alignment of parts. The switch proper is also a self-contained unit snapped into place in the frame. The sturdy knife edge bearings are formed from separate stampings, easily replaceable although this is said to be rarely necessary. They are not welded or riveted to the frame but are interlocked into position. The switch is a snap action toggle assuring rapid make or break. All moving parts have been kept light in weight for rapid action.

Switch contacts are of fine silver fastened to brass supports of the double pole double break type. Contacts are normally closed by springs and opened by bakelite push rods operating through the bakelite switch case. Each circuit is in a separate chamber, preventing possibility of flash-over. The push rods also act as barriers during opening of the circuit. Con-



(Continued on Page 92)

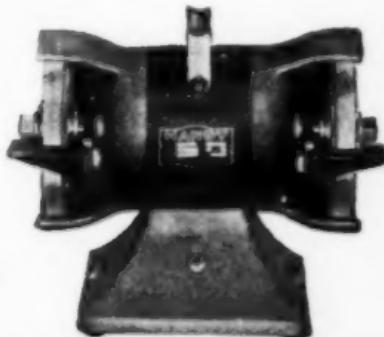
BALDOR

BALL BEARING GRINDERS

A Complete Line—6" to 12"



Bench and Pedestal types. Built for
HEAVY DUTY. 1-YEAR GUARANTEE
Prices range from \$19.50 to \$208.00



MAIL QUICKMAIL COUPON NO. 18 FOR BULLETINS
BALDOR ELECTRIC CO.
4368 Duncan Ave., St. Louis, Mo.

BALDOR GRINDERS
are built by Motor Specialists

tacts are easily renewable, and terminals are marked showing connections for motor and lines.

Adjustments for pressure are made by means of a screw in center of top bar—the smaller one at the end of the bar adjusts differential. The pressure adjustment may be increased through a considerable range without changing the pressure differential. The differential adjustment is provided with a stop to prevent setting this lower than the proper working range of the switch.

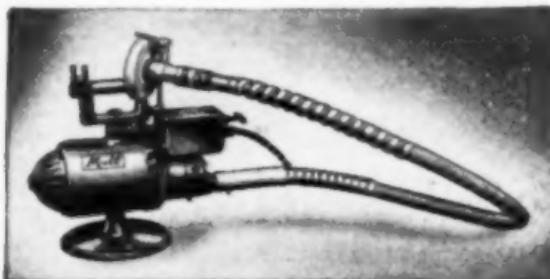
The diaphragm enclosure is regularly furnished with a $\frac{3}{8}$ inch air connection but other sizes may be supplied when desired. All switches are furnished regularly with diaphragms of synthetic rubber fabric which is not affected by oil.

There are two outlets for $\frac{1}{2}$ inch conduit, side by side.

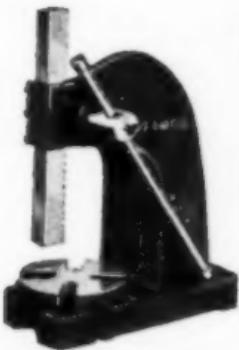
Write the makers on your business letterhead for complete information, which will be furnished without obligation.

Mall Presents a New Grinder

The Mall Tool Co., 7740 So. Chicago Ave., Chicago, offer a new grinder for heavy industrial applications, operating at high speeds and providing fast cutting



action. It is equipped with a geared head to deliver 4500, 5500 or 7000 r.p.m. and can be furnished with angle or straight spindles for all types of grinding, sanding or polishing. Option is given of a low, round steel base as illustrated, or high or low caster base for any specific requirements. Detailed information on this and other Mall Grinders will be furnished gladly by the makers on request. Write to them on your business letterhead.



Plain Lever Type

SAVE MONEY WITH THESE **FAMCO PRESSES**

Quality plus low price make the Famco line outstanding in press value.

Famco Arbor Presses are sturdy and efficient. Frames are semi-steel—ram and pinion specially selected steel — heavy stub teeth. Square rack gives better bearing and eliminates side sway.

Furnished with plain lever or ratchet as shown—or with compound ratchet levers and pilot wheel.



Ratchet Type



Famco No. 12

Famco Foot Presses cannot be excelled in the production of light metal stampings for electrical appliances, jewelry, novelties, springs, radios, etc.

Quickmail Coupon No. 58 will bring you full information.

FAMCO MACHINE CO.,
RACINE, **WISCONSIN**

••••

Williams' Alloy Steel Chain Pipe Tong

A new chain pipe tong, forged from alloy and high tensile strength steel and heat treated is announced by J. H. Williams & Co., 75 Spring St., New York City. Known as the Vulcan Supertong, the design and construction are identical with those of Williams' Vulcan tongs.

The maker asserts that the new Super-



tongs have at least 50% greater strength than the regular Vulcan tongs of corresponding size, without any increase in size or weight. The Supertongs are equipped with Williams' new Superchain—made from alloy steel, heat treated and cadmium plated—which is said to have increased strength to match that of the Supertongs.

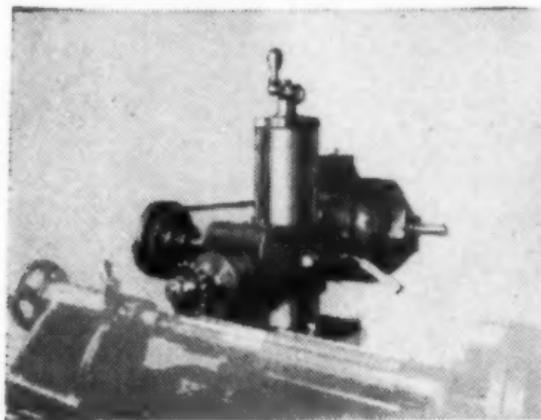
Supertongs are attractively finished in gray enamel. The jaws have blue panel with bright faced edges. There are 8 sizes for pipe from $\frac{1}{8}$ to 18 inches. The maker will gladly send you complete information.

New Type J. Nicholson Air Valves

Bulletin 937, just issued by W. H. Nicholson & Co., gives complete information pertaining to the new style J Nicholson air valves, available in three and four-way types for operating single and double acting cylinders utilizing air or oil on pressures to 125 pounds. Made in $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ inch sizes, of flat disc protected seat design, with bodies and seats of semi-steel and discs of bronze. Port areas are said to be equivalent to full area of pipe sizes they accommodate, and port design permits throttling or full opening as required. All pipes are 90 degrees apart and lead from valve base horizontally. Valves may be disassembled without breaking pipe connections. Operating levers require 90 degrees travel for complete cycle and may be adjusted radially on valve stem as desired. W. H. Nicholson & Co., 12 Oregon St., Wilkes-Barre, Pa., will send you copy of the bulletin on request.



★ IT'S AMAZING !!! The MASTER Lathe Converter ★



Easily and quickly attached to an ordinary engine lathe.

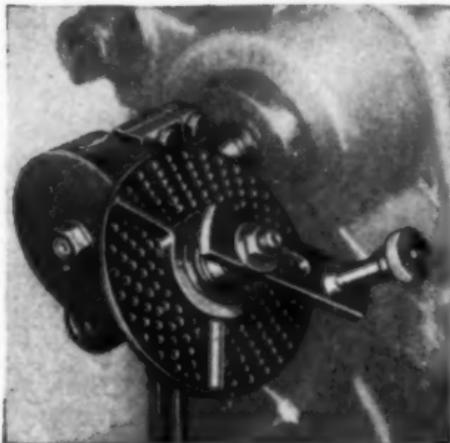


Does all milling operations such as: gear work, spline work, broaching keyways, hobbing etc. Grinding at all angles, internal or external.

**No Dismantling of Lathe — Fits on compound same as your tool post.
Not "Just Another Lathe Attachment"**

USE QUICKMAIL COUPON NO. 82

The MASTER Geared Type Dividing Head ★



Fits into rear open end of lathe spindle. Has 40 to 1 reducing gear—counting indicators, three plates allowing 720 divisions. Collet furnished to fit your spindle.

**MASTER MACHINE & TOOL CO.
NORTH KANSAS CITY, MISSOURI**

Putnam Uses Salt-Bath Heat Treating

The Putnam Tool Co., Detroit, Mich., announce that the salt-bath process is now used in the heat treating of their entire line of cutting tools. This method involves submersion of the tools in four successive salt baths in which uniform temperatures are maintained constantly by special electrical controls, tempering in a Homo electric furnace and finishing by shot blasting.

Two salt baths are used for preheating at temperatures between 1500 and 1600 degrees. A third bath is for high heating at 2300-2350 degrees. The fourth or quenching bath is held between 1100-1200 degrees. After the quenching bath, the tools are allowed to cool in still air, then placed in wire baskets and put in the Homo furnace where they are tempered in a 1025-1075 degree temperature, and afterwards finished in a special blasting chamber with minute particles of steel shot.



The Putnam Co., point out that as the tools are completely submerged in the solution and heated in a neutral atmosphere, oxidation or scaling are impossible and no decarburization occurs. As every portion of each tool reaches the same temperature simultaneously there is no distortion.

ACE SPOT WELDERS

FOR ECONOMICALLY FASTENING OR JOINING
ASSEMBLIES OF SHEET METAL OR WIRE.
CHEAPER, FASTER AND BETTER THAN RIVETING.



AVERAGE COST OF CURRENT
FOR 1,000 SPOT WELDS
Only 3 Cents.

Average worker, with a little practice can produce as satisfactory spot welds with ACE Spot Welders as the most experienced operator.

Available in sizes from 5 K. W. up.

Priced as low as \$90.00

Investigate possibilities of increasing your profits by using ACE Spot Welders. Send Coupon No. 48 today for full details and prices.

PIER EQUIPMENT MFG. CO.

WELDING EQUIPMENT DIVISION

628 Cross Street, Benton Harbor, Michigan

Hilliard Clutch Bulletin

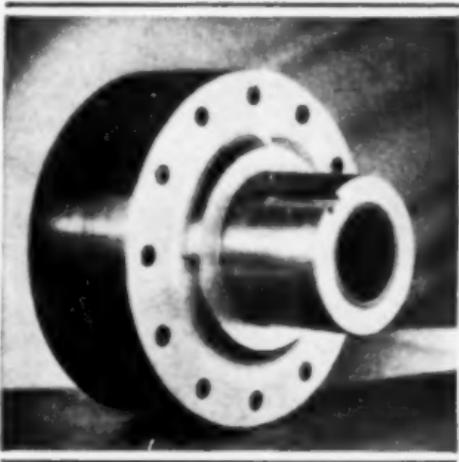
"Hilliard Over-Running Clutches," a bulletin recently issued by the manufacturer of the clutch shown here, explains the functions of this unit in mechanical detail. Engineering drawings and photos of installations demonstrate at a glance the numerous applications of over-running (or "free-wheeling") clutches. On production machinery which runs intermittently or with reciprocal motion, it is explained how this clutch transmits power efficiently through the operating cycle, then automatically disconnects and idles until power is again applied.

The unit is also used in dual drives to protect the prime mover which is not in immediate use and to transmit power from the other, and also to control two-speed drives. It provides an excellent ratchet application capable of infinite adjustments and a positive backstop for conveyors, elevators, etc.

The manufacturers, The Hilliard Corp., Elmira, N. Y., will gladly send you a copy of the bulletin. Address them on your business letterhead, mentioning The BLUE BOOK.

Picturing the Janette Line

An attractive new folder illustrates numerous members of the Janette line, including motorized blowers, generators, motors, motor-generators, gasoline electric plants, motorized speed reducers, inverted rotary converters, etc. A copy of the new folder and any other desired information will be sent you on request by the Janette Mfg. Co., 556 West Monroe St., Chicago.



LOW COST Production-

THE RESULT OF THIS
ENGINEERING SERVICE



Complete line of automatic riveters for setting up to 4 rivets at a time.

More and more, industry has learned that it pays to take advantage of the engineering service offered by this company. Consultation in the period of assembly design many times results in minor changes permitting lower costs thru standardization, improved service and often economies thru multiple rivet setting. Where this preliminary consultation is not permissible send blue print or preferably sample assembly for production study and analysis involving the use of tubular or split rivets.

CHICAGO RIVET & MACHINE CO.
1855 S. 54th Ave., Cicero P. O., Chicago, Ill.

Chicago



ONE OF THE WORLD'S LARGEST MANUFACTURERS
OF RIVETS AND RIVETING EQUIPMENT

Use QUICKMAIL COUPON NO. 56

It will bring you our rivet price list and illustrations of Chicago Automatic Rivet Setters. On specific production problems write letter and send sample assembly or blue print.

Scherr Presents New Mauser Vernier Caliper

Toolmakers will be interested in this new Mauser Vernier Caliper. Graduated in 1/1000 and 1/128", it is known as type No. 537 with height gauge combination. It is available in three sizes with 7, 9 and 11 inch measuring capacities. A base is furnished, which if attached by means of a screw and accurately tapped center at end of one jaw, converts the caliper into a height gauge.

This base is of a new design, heavier and larger to prevent tilting of the height gauge on the surface plate.

The vernier caliper also has two knife edges for use in layout work or for measuring distances between holes, root diameters of gears, etc.

The scribing attachment is a separate unit, attachable to the upper jaw, and adjustable, making it possible to set the height gauge at an even figure of the scale when starting to measure.

Write direct to the George Scherr Co., 128 Lafayette Street, New York for further information, using your letterhead and mentioning The BLUE BOOK.

Dykem Metal Marking Colors

Marking of parts numbers, alloy numbers, names, dates or other identification data is facilitated by the new Dykem metal marking colors. Available in red (KR) and in purple (KF) the markings are applied by rubber stamping or stenciling. They are said to contain no oil or moisture and to give a clear, distinct impression which dries in 10 seconds with a thin, tough coating which resists oil, moisture, cold and frequent handling. It is asserted that even a thin film of oil does not prevent the colors from adhering firmly as the color immediately penetrates the oil film and dries quickly on the metal surface, without harming any metal. The color comes in 8 oz. cans with brush-in-cap; pints or quarts. A sample will be sent to any firm on request. Address The Dykem Co., 2301 North 11th St., St. Louis, Mo.





Mall TRADE MARK **PORTABLE FLEXIBLE
SHAFT GRINDERS**

A type and size for every grinding, sanding,
polishing and buffing requirement!

**POWERFUL
EFFICIENT
COST CUTTING
TOOLS**

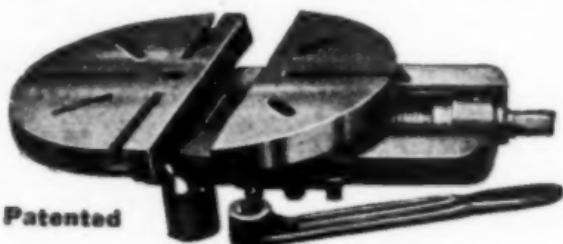
*Send Quickmail Coupon No. 46 for descriptive
literature and let us assist you in selecting the
unit best suited for your work.*

MALL TOOL COMPANY
7742 South Chicago Avenue
Chicago, Illinois

Offices and Distributors in all Principal Cities

FREE TRIAL OFFER

Combination Drill Table and Vise



**GUARANTEED To Save Its Cost in
Labor Every Six Months**

When a production machine is down, think what a ten-minute saving on a job like this would mean. A Combination Drill Table in your repair shop is always ready for all emergency jobs.



Costs you nothing. If you are not satisfied in 30 days, we will pay the freight both ways. Use Quickmail Coupon No. 57.

MODERN MACHINE TOOL CO.
JACKSON, MICHIGAN
Manufacturers of the "Modern" Cutting-Off Machine



"24 to 48 HOURS? . . . MAN-THAT'S SERVICE!"

Place yourself behind this man's desk. You need certain collets and pushers—in a hurry. You place your order with "Modern" and find that within 24 to 48 hours they will be on the machine—doing the job the way you want it done! Isn't that the type of service that means complete satisfaction to you?

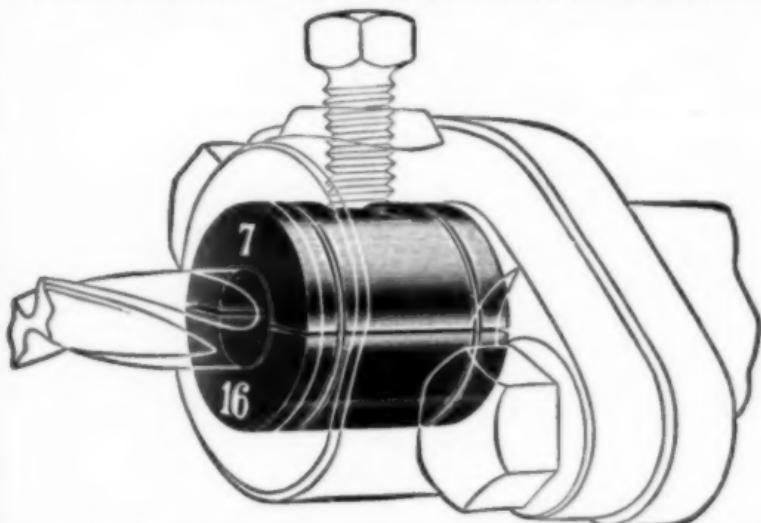
Or perhaps your requirements call for tubes, cams, chucking fingers or any other perishable screw machine parts or tools. Again your "Modern" specification is positive assurance of the quickest possible delivery and dependable, economical performance.

Catalog 33 includes complete information and prices on all perishable parts and tools for all types of screw machines. Send Quickmail Coupon No. 28 today!

MODERN COLLET & MACHINE CO.
403 SALLIOTTE ST. **ECORSE, MICH.**

■ BUSHINGS ■

For DRILLHOLDERS for use on Automatic Screw Machines



BANNER BUSHINGS

are hardened two-piece bushings designed for use in drill holders for B & S automatic screw machines. This type of bushing clamps the full length, requiring very little pressure from the clamp screw to hold the drill firmly. When the clamp screw is loosened, the pressure is released.

All bushings smaller than $\frac{3}{32}$ " have a milled hole. This feature assures accuracy in the small sizes. The larger sizes have drilled holes.

**BUSHINGS ARE CARRIED IN STOCK FOR
IMMEDIATE SHIPMENT.**

Write for the BANNER Catalog for Prices. Use Quickmail Coupon No. 69.

BANNER MANUFACTURING CO.
1873 Clybourn Ave., - - - CHICAGO, ILL.



DRILL JIG

BUSHINGS

ASA



Standardized

Prompt delivery from stock on over 10,900 standard items — over 6700 ACME Standard — over 4200 A. S. A. Standard — all completely finished ready for use. *Special sizes made to order.*

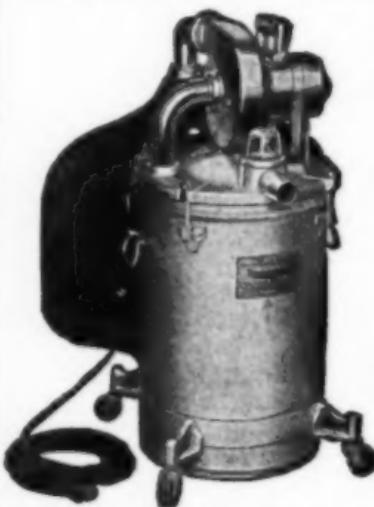
Made in our new plant by the most exacting and scientific methods — insuring accurate fit plus long wear — concentric within .0003" full indicator reading.

Types shown at left, top to bottom, are: plain stationary press fit, type 'P'; shouldered stationary press fit, type 'S'; removable slip, type 'R'.

Send Quickmail Coupon No. 39 for bulletin containing complete data and low prices. Satisfactory service guaranteed.

ACME
INDUSTRIAL CO.
210 N. LAFLIN ST.,
CHICAGO, ILL.

**For the First Time! Vacuum Cleaning
Made Applicable to All Plant Cleaning
Requirements at Low Cost With**



Breuer's Ball Bearing

TORNADO

Portable Industrial
Vacuum Cleaner

This new machine is designed to solve all industrial cleaning problems without the expense of installing a stationary plant or using so-called portable cleaners which are too heavy and expensive for average plant applications.

TREMENDOUS POWER

1 H. P. Motor— $46\frac{1}{4}$ " Waterlift

Do not confuse the TORNADO with light-duty cleaning machines. Model 112 combines light weight (only 40 pounds) with tremendous cleaning power (1 H. P. G. E. ball bearing Motor— $46\frac{1}{4}$ " waterlift). Patented principle of separating fine dust from refuse and depositing heavy dirt in tank makes this cleaner as applicable to heavy duty work as the largest machines. Sturdy construction insures long life and low yearly cost.

Has plenty of power and capacity to handle dust, dirt, sand, sawdust, metal scraps, filings, etc. Attachments available for cleaning boiler tubes, ovens, machinery, walls, floors, pipes, etc. Motor unit can be quickly removed for blowing dust from motors, etc. The handiest heavy duty, low cost, time and labor saving unit ever built.

We prove TORNADO advantages right in your plant without obligation. Send Quickmail Coupon No. 30 for details of trial offer and further information or write.

BREUER ELECTRIC MFG. CO.
842 Blackhawk Street, Chicago, Illinois

HI-DUTY PNEUMATIC MARKING MACHINE

This is a light, general purpose hand marking machine for use on flats, rounds and irregular surfaces, which is supplemented with an air cylinder to take the place of the foot pedal for applying pressure to

raise the work table to the lettering tool. Air from the shop line is used and the four way foot valve assures fast operation. Machine uses solid flat or round dies, as well as adjustable type, in flat or knurl type holder.



MODEL 25

*Send Coupon No. 70 for complete catalog of our full line
of Marking Tools, Machinery and Equipment.*

Designed and Built By

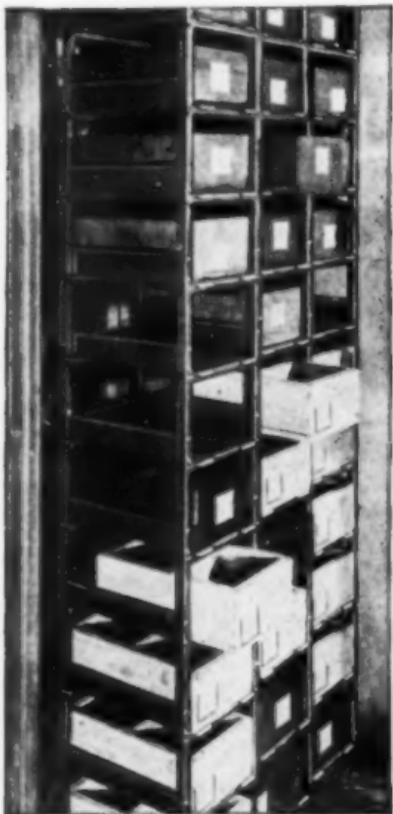
GEO. T. SCHMIDT, INC.

1802 Belle Plaine Avenue,

Builders of Marking Equipment since 1895.

Chicago, Illinois

STACKED— and Still Accessible



STACKRACKS add extra floor space to your shop. These heavy steel individual racks, made to fit your shop boxes, trays or tote pans, securely lock together without the use of tools to form a rigid unit of any capacity and height. Stack scattered boxes up, out of the way, squarely and safely.



STACKRACKS add extra minutes to the day without extra wages. Eliminate labor wasted on unpiling and repiling. Any box wanted slides out like a drawer. Instantly accessible.

*Send for the facts on STACKRACKS
Write for descriptive literature—see
how little it costs to add room to
your shop, time to your day.*

**STACKBIN
CORP.**



PROVIDENCE, RHODE ISLAND

Stackbin Corp.,
55 Troy St.
Providence, R. I.

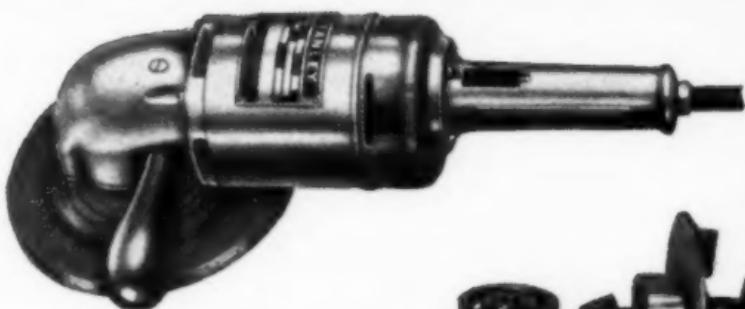
Without obligation, send
literature on STACKRACKS

Name _____

Firm _____

Address _____

New STANLEY 7" Disc Sander



**THESE GEARS
Tell Only Part
Of The Story!**



Gears are mighty important in a disc sander's life. That's why Stanley uses these spiral bevel gears for smoother action and long service.

Motors are important, too! Stanley powered this tool with a motor similar to that used in the Stanley $\frac{1}{4}$ " Electric Drill. And mounted the shafts on oversize ball bearings designed to take the end and side thrust of the man who "leans on" this grinder.

Stanley No. 77 is a double handful of action — useful in any shop for sanding, grinding, buffing of steel sheets, castings, welded joints; for aluminum, bronze, fibre, and wood. Ask your Stanley distributor for a demonstration to prove that this tool is right in speed, in weight, balance and power. Or write for further information. Stanley Electric Tool Division, The Stanley Works, New Britain, Conn.

STANLEY ELECTRIC TOOLS

"COST LESS PER YEAR!"

ADJUSTABLE
While Running!



NEW
Absolutely Different

THE PRECISION UNIVERSAL TOOL HEAD

does the job faster, more accurately and
for less cost, because it is

ADJUSTABLE WHILE RUNNING!

For boring, counterboring, recessing, tre-
panning, undercutting, etc.

For bulletins and additional information,
send Coupon No. 60

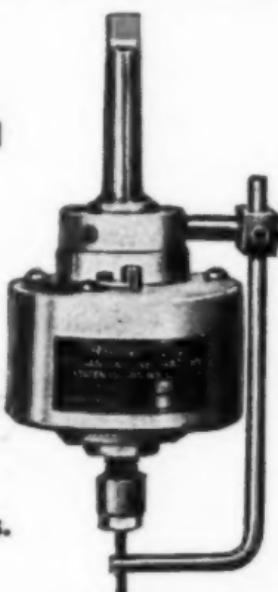
THE PRECISION TOOL COMPANY
Bridgeport, Connecticut

ERRINGTON HYSPI

*Super-Sensitive Ball Bearing
Cone Drive
2 to 1 Auto-Reverse Tapping Chuck*

Combination
Bronze & Ball
Bearings
Thru-Out

Easy and
Economical
Replacement
of
Cone-Clutches.



Depth gauge
facilitates
Quick-Handling
Especially
on
Bottom-Holes

Other Styles
and Sizes
0" to 2" taps

Size	Taps in Steel	Taps in Cast Iron	Price	Code
No. 00	0" to 3/16"	to 1/4"	\$35.00	Phlam
No. 0	to 7/8"	to 1/2"	\$50.00	Phalanx

The principle on which this Style is designed is especially effective on very small tapping; whereas in the No. 0 size the Frictional Grip is Greatly INTENSIFIED, to cover a wider range, without loss of sensitiveness.

Errington Mechanical Laboratory

Main Office and Works: STATEN ISLAND, New York

Chicago Office: 6047 N. Talman Ave. New York Office: 220 Broadway Boston Office:
930 Old South Bldg.

The Fastest Manual Small Tapping Known to the Art

Ettco-Emrick MULTIPLE TAPPING

HIGH PRODUCTION SENSITIVE SMALL TAPPING PRESENTS THE SAME SAVING POSSIBILITIES AS ANY OTHER IMPROVEMENT.

WHAT HAVE YOU DONE ABOUT IT?

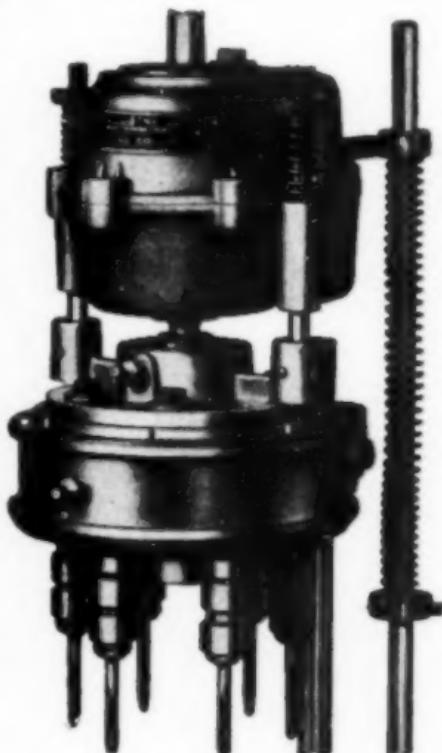
Multiple heads, the Ettco way, are a new proposition.

If you have thought of multiple tappers as a few taps, precariously sticking out in the air—forget it.

Ettco heads are engineered for the job. The work, work holder and head are properly tied together. The hole line up is perfect.

The results are better holes to a better gage fit and with far less headaches than with ordinary single tapping.

Capacity No. 2 to $\frac{1}{4}$ " taps.



IF YOU WILL SEND US A DRAWING WE'LL GET YOU OUT A STANDARD QUOTATION—TELL YOU THE PRODUCTION AND GIVE YOU A GOOD IDEA OF HOW WE WILL ENGINEER THE JOB.

Drop us a line for our catalogue. Use Quickmail Coupon No. 49.

ETTCO TOOL CO.

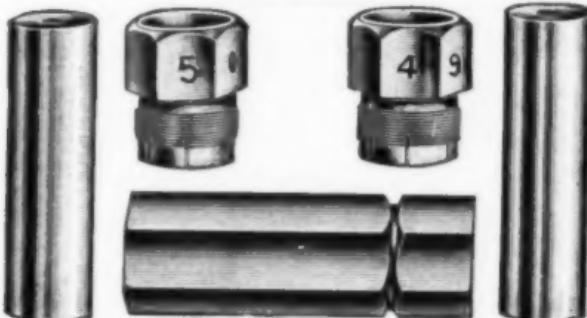
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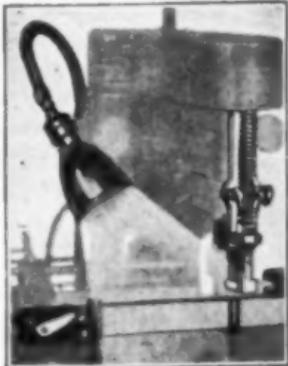


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TWO MORE
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Heavy Duty 16 and 30 inch Scroll Saws are well lighted by VIMCOLIGHTS as a part of each machine.

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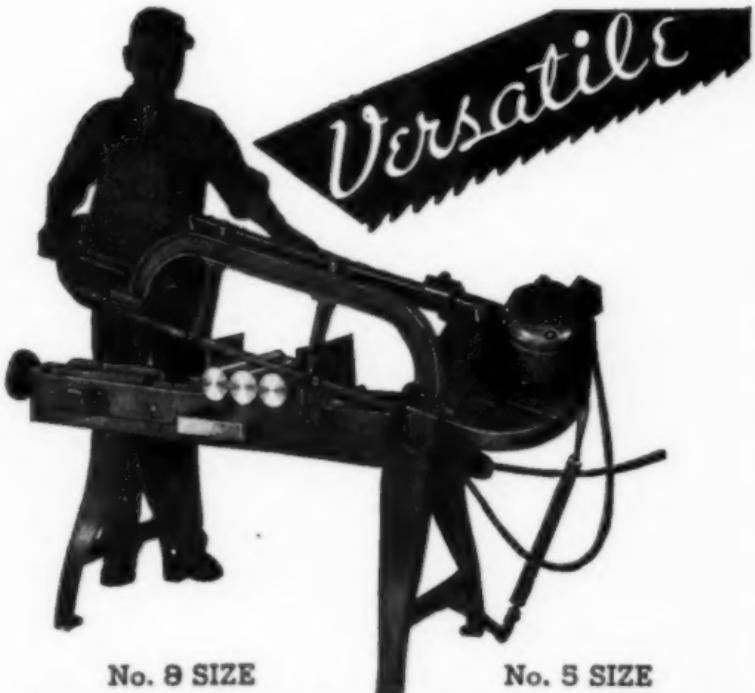
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8 in. diameter round
or 8 in. by 16 in. flat.

No. 5 SIZE

5 in. diameter round
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WELLS Metal Cutting BAND SAWS

Versatility in metal cutting reduces equipment and labor cost to a minimum. WELLS BAND SAWS cut most any metal to practically any shape faster and more economically. They eliminate the necessity of additional equipment for varying metal cutting operations. Accurate, a closer tolerance can be kept on a Wells saw — cutting machining time to a fraction. Send Quick-mail Coupon No. 31 for bulletin on the saw of 1001 plant uses.

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New 17" Two-Spindle "DELTA" DRILL PRESSES



SPEEDS

385, 600,
935, 1450
and 2240
r. p. m.

\$249.25

With No. 2 Morse Taper
Spindles, less motor.

Meeting with Growing Favor Wherever Used

The heads of this drill press with the streamlined guards completely covering the spindle pulleys and belts, are of the same design that has proved so popular in the previous models. Heads are interchangeable, so that either two spindles with No. 2 Morse tapers, two spindles with Jacobs chucks, or one of each type can be used on the machine as desired. Spindles also may be quickly interchanged without changing heads.

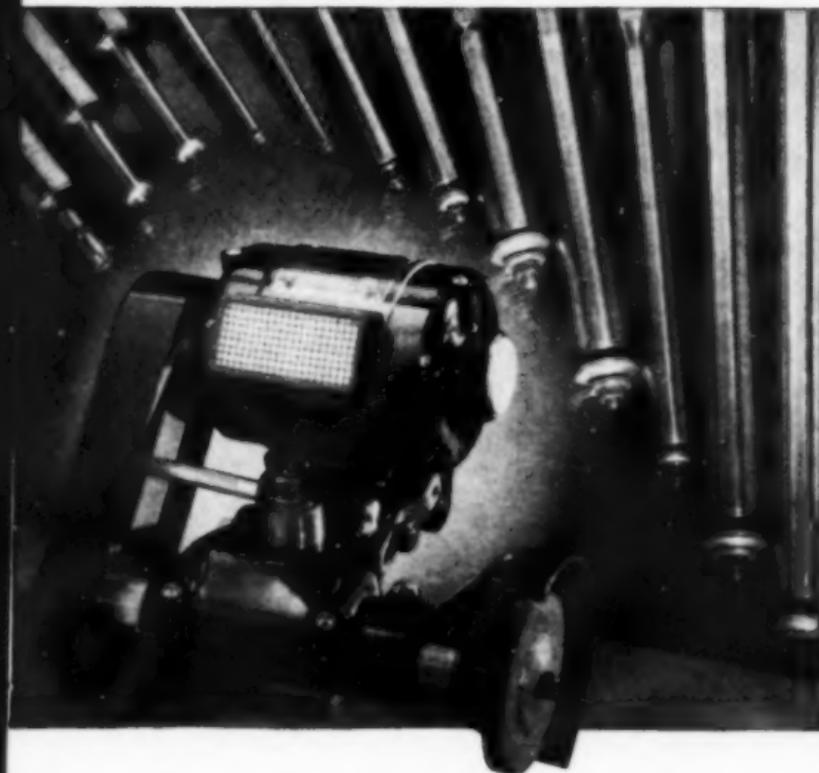
Exclusive inverted-spindle design, with automobile-type 16-tooth spline drive and floating spindle sleeve. Spindles carried in New Departure self-sealed ball bearings. All ball bearings are lubricated at the factory, and require no further attention or lubrication during their entire life.

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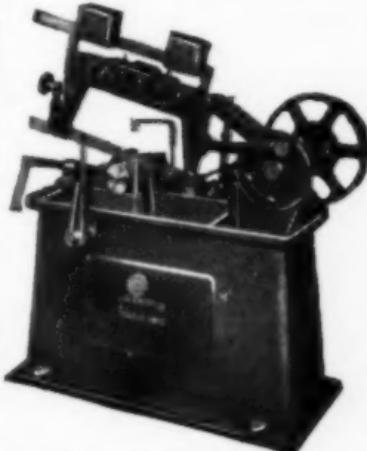
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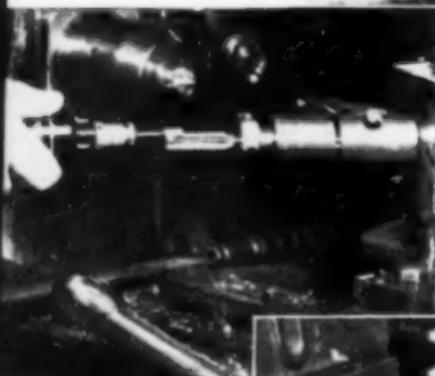
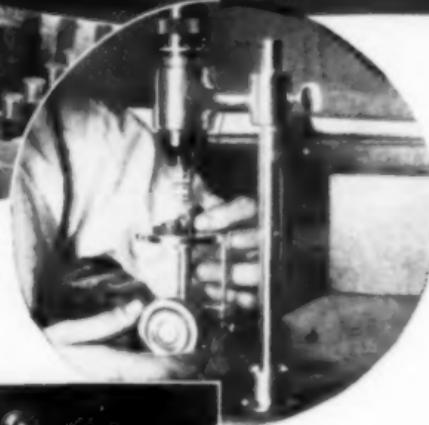
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will save hundreds of dollars
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30 DAYS
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It's Easy to Own!

Don't go another day without getting facts about how little it costs to own this amazing new tool that cuts costs squarely in two in pattern room, tool room, maintenance and production, as well as in jig and die work.

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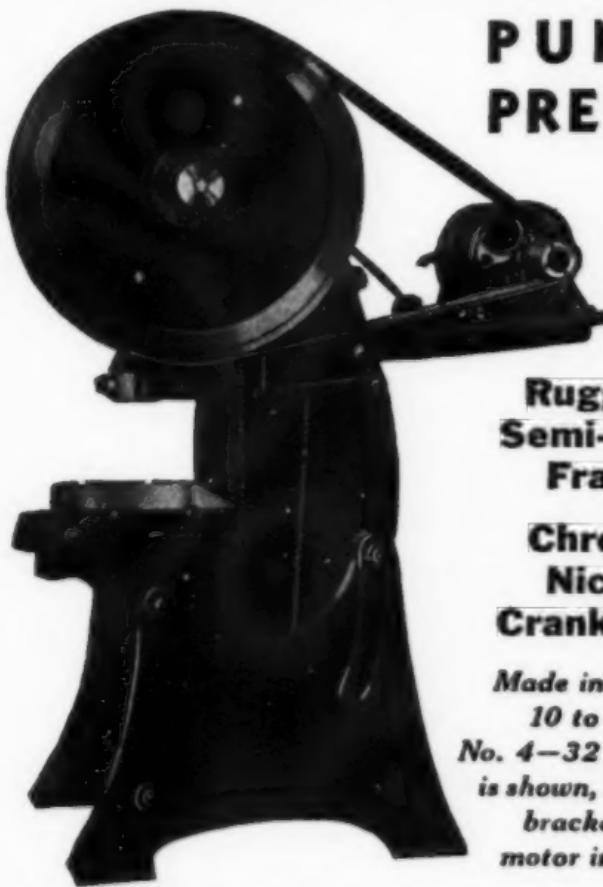
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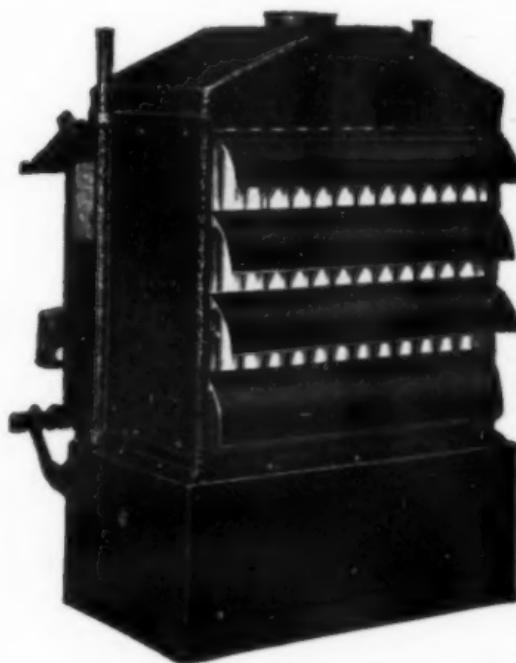
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In finishing and assembly work it is often desirable to use a hammer that can strike more than one kind of blow.

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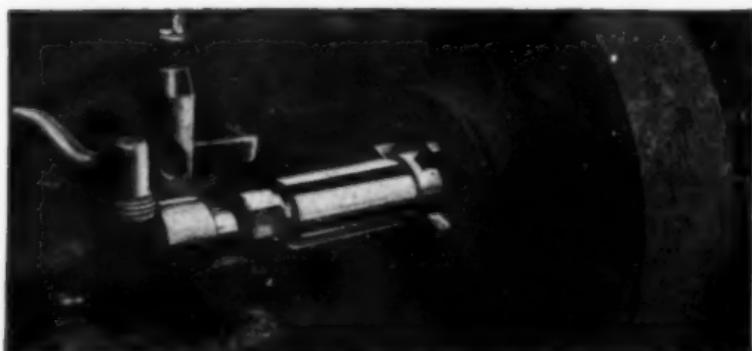
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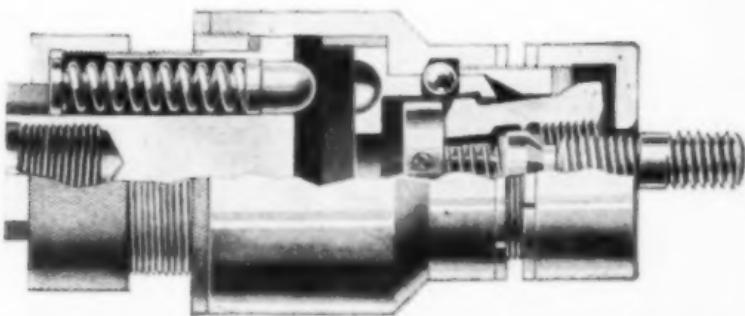


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Chicago Rawhide



HAMMERS

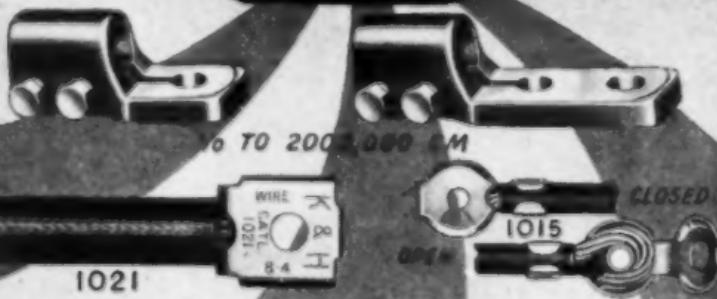
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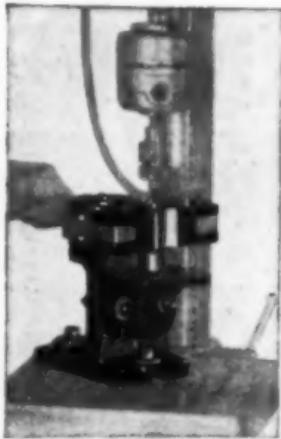
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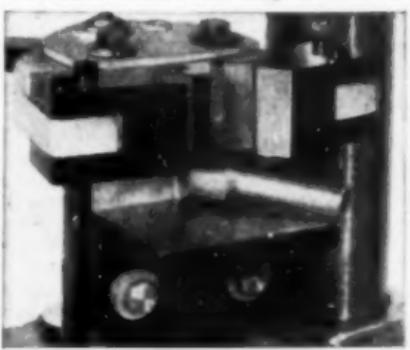
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1 $\frac{1}{2}$ " deep in shackle pin.

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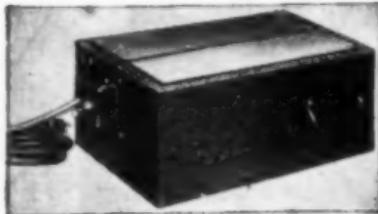
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Takes magnetism out of dies that have been magnetized
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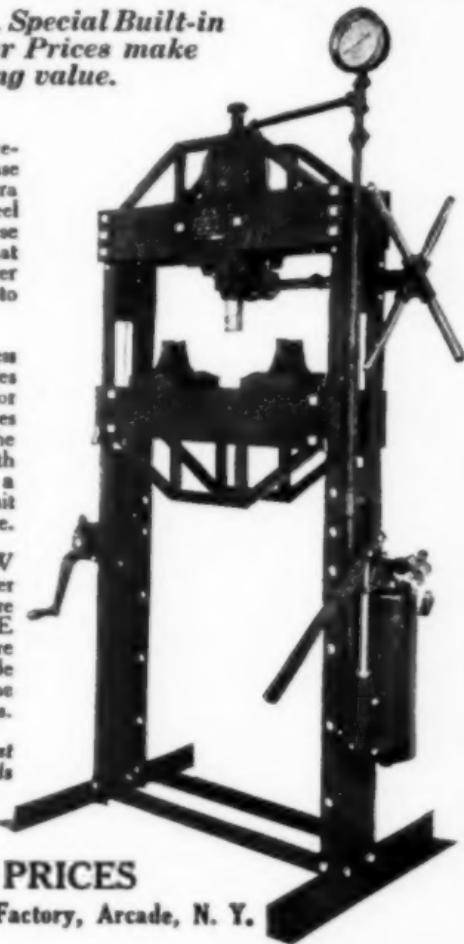
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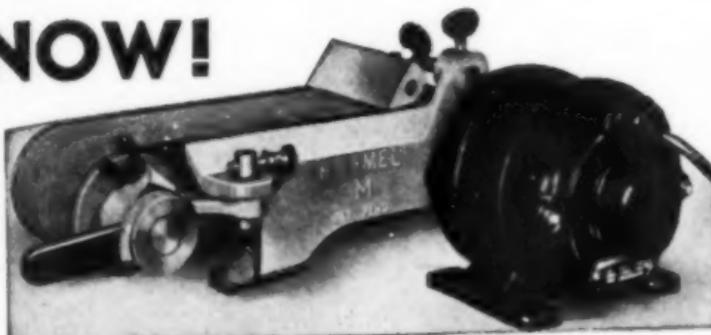
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BECAUSE motor is 1/10 h. p. possessing many times more power than Hand-grinders.

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SAVES TIME AND
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all materials. Turns out work you can show with pride. Takes 10 seconds to do 10 minutes hand work. Absolutely safe and dependable. Many users have found that this rugged machine pays for itself on the first job. There are scores of jobs in every plant where it can be used to advantage.

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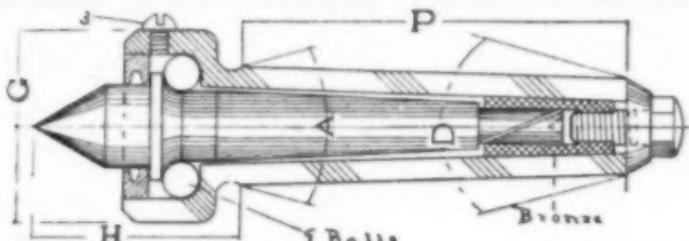
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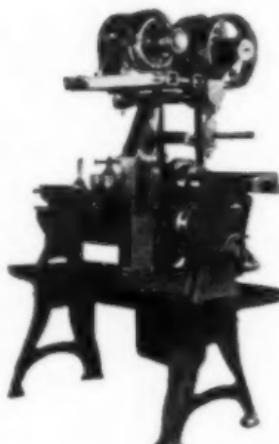
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by Berkeley

Benefit by a wider speed range —handle increased variety of work. Berkeley Drives give rapid speed change — smoothness and flexibility of belt drive with efficiency of gear equipment, at a cost that meets streamlined budgets.

Write TODAY for full information.

Berkeley Engineering Co.,
1381 East 17th St., -:- Cleveland, Ohio





Triplex
Step Bolts

Step Bolts That Save “Misfit” Time Losses

TRIPLEX uniform free-running threads mean economical assembly operations. Add that money saving quality to strict steel specifications and modern electric heat-treatment and, like thousands of other fussy users, you'll find out why Triplex is a better source of supply.

Write today for catalog and samples.

THE TRIPLEX SCREW CO.
5377 Grant Ave., Cleveland, Ohio

TRIPLEX

Complete
Line of



CAP AND SET SCREWS, BOLTS AND NUTS

**HERE'S SOMETHING USEFUL!
This SIZE AND DIMENSION WALL CHART**



(measuring 12x15 inches)
**lists the complete
range of**

STANDARD WROUGHT WASHERS

specifying all dimensions, unit weight, etc., and illustrating washers in exact size for easy identification.

**Sent free to
rated firms**

**WROUGHT WASHER
MFG. CO.**

**2224 So. Bay St.,
Milwaukee, Wis.**

ASTONISHING LOW PRICES

87

Layout Plates Angle Plates and Cubes

Layout table is 30"x60", with adjusting screw in each leg to provide perfect table alignment. 1" table edge facilitates clamping. Bench type is 16"x20". All parts are carefully planed and commercially accurate.



**Heavy Ribbed
Layout Table,
wght. - 1000 lbs.**

\$135

**Write today
for full
Information**

Parsons-Merritt Co.



Just Move This Post

On your **RIDGID** No. 65R
and Avoid the Bother of
Changing Chaser Dies

No more waste of time looking for different size dies when you want to thread 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ " or 2" pipe if you have a **RIDGID** No. 65R. Simply move the setting post to the pipe size you want. One set of dies instead of 4 sets—one-fourth the bother.



You'll like the new-style work-holder, too. Twist the gauge ring to pipe size, put on the pipe, tighten one screw—quick and easy.

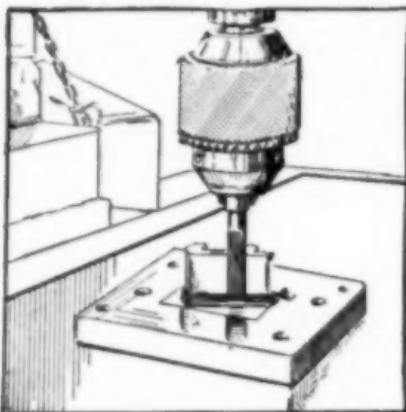
Thousands have found also that this new No. 65R cuts clean accurate threads in all variations, all kinds of pipe. It's a time, temper and money saver.

For more profitable work with less effort, get one of these threaders at your Jobber's.

THE RIDGE TOOL CO., Elyria, Ohio, U.S.A.

A **RIDGID** PIPE TOOL

"PROFILE" ROTARY FILES



Use them in your
DRILL PRESS

for filing punches—for final touch-up of all accurate work in metal. Lots of other uses—many shapes and sizes—large stocks—quick service.

Write for full information

THE ROTARY FILE COMPANY
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**100%
Adjustable**



SHOP SPOTLIGHTS

Place Light Where It Is Needed

Models for Office, Factory and Drafting Room carried in stock.

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PRICE \$3.50 in single lots
\$3.25 in lots of six
F. O. B. Factory

Chicago Die Casting Mfg. Co.
2502 W. Monroe St., Chicago, III.

A LITTLE MONEY BUYS A BIG SURFACER

FOR ALL SURFACING WORK



Complete as shown, including bench, dust-collecting unit and rolling table, motor ($\frac{1}{2}$ h. p. 60 cy. A. C.) and lamp.

YOUR NEARBY Walker-Turner dealer will supply this machine promptly. Descriptive bulletin sent on request. Use Quickmail Coupon No. 77. Walker-Turner Co., Inc., 17117 Berckman St., Plainfield, N. J.

**"Series 900"
Belt-And-Disc
Surfacer**

\$136.95

At this low price, Walker-Turner offers you a surfacer of sufficient ruggedness and capacity to handle any job. All three methods of surfacing; on all materials including large areas and panels up to

30" wide, any length. 4 dust-sealed bearings, complete dust-collecting system, carefully balanced disc and pulleys. If finishing of wood, metal, cork, plastics or other materials is an important part of your production, see this machine.

WALKER-TURNER
Engineered POWER TOOLS

FOR A THOUSAND AND
ONE TOUGH HAND JOBS



**M-B 'Heavy Duty'
AIR GRINDER**

**3
RANGES OF SPEED
25,000, 45,000 and
65,000 R. P. M.**

**3
STAGES OF POWER
with maximum rating
of over $\frac{1}{4}$ H. P.**

Furnished with adapter for use in tool post of
machine for internal jobs.

M-B "SUPER SPEED" AIR GRINDER

Has revolutionized the hand air operated
grinder field. First and only grinder to have
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pounds air pressure. Amazing power.
Weight $8\frac{1}{2}$ ounces.



Write today for details

M-B PRODUCTS

130 E. Larned Street,
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For Your RIVETING

**LINLEY NOISELESS ROTARY
RIVET SPINNING MACHINES**

Assure Peak Production and Lower
Maintenance. Rigid and Powerful.
Bench and Floor Types. Motor or
Belt Driven. There is a Linley
machine for every riveting job.



*Send samples of your work for
riveting, cost of equipment, and
true estimates on production.*

"Built to Last—Riveting Fast"

LINLEY BROTHERS CO.

579 Fairfield Avenue, Bridgeport, Conn.

NEW AMES ENCLOSED HEAD



Precision Lathe with Ball Bearing Spindle and Transitorq drive. Length 36"—Swing 8 $\frac{1}{8}$ "—Collet Capacity 1"—Motor $\frac{1}{2}$ h. p.—Double V-Belt Drive.

Send for Bulletin.

B. C. AMES COMPANY
WALTHAM, MASS.

6314

In Spite of Precautions Taps Break in the Hole

That's bad enough—but the real expense comes in stripping the threads when you remove the broken tap.



The Walton Tap Extractor
offers an effective, instantaneous way of overcoming this loss. Its steel fingers inserted in the broken tap remove it intact. An apprentice can operate it!

Made in two, three and four-flute styles

Often pays for itself in the 60 day trial allowed

The Walton Company
95 Allyn St., Hartford, Conn.



New Drill Grinding Attachment

fits the Black & Decker Grinders, gives you a correct grinding of twist drills.

PRICE ONLY \$18. Why not own one that you may be able to grind your twist drills the way they should be ground.

Write to

C. H. CARLSON MFG. CO.

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CENTERLESS GRINDING

Straight, cylindrical, double diameter.

Shoulder and profile surfaces.

All kinds of materials

SCREW MACHINE PRODUCTS, HEAT-TREATED
AND GROUNDED, IF NECESSARY



Send Blueprints or Samples for Estimates

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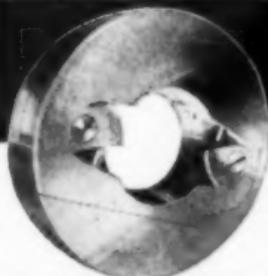
Cincinnati, Ohio

GRINDING WHEEL DRESSERS



Write for
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and Cutters—
no obligation

THE DESMOND-STEPHAN MFG. CO.
URBANA, OHIO



SENECA FALLS *Automatic* WORK DRIVER

Self Centering . . . Quick Acting . . . No slip.
Attaches to any chuck plate or spindle. Provides
a slip-proof, balanced drive reducing chatter.
Handles rough forgings or turned pieces—straight
or taper. Eliminates dogging time. Reduces tool
breakage. Write for details and size range.

SENECA FALLS MACHINE CO., 314 Falls St., Seneca Falls, N. Y.

THE NEWEST DEVELOPMENT IN METAL CUTTING MACHINES

FULL AUTOMATIC—CAPACITY 6"x6" or 10"x10"

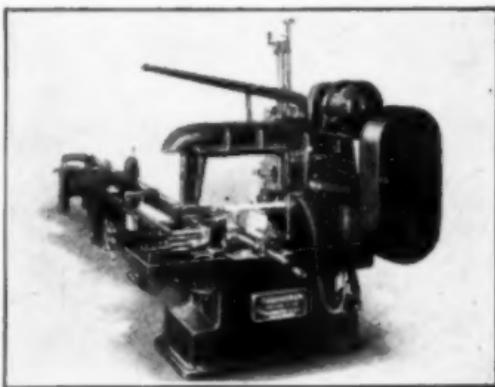
Stops when desired number of pieces have been cut.

Length of cut is gauged by scale without end stop.

Swivels on base for angular cutting.

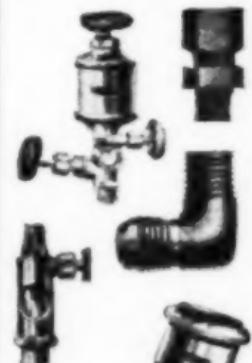
Three speeds by V belt.

Also built for manual operation.



Send for circulars containing complete information.

RASMUSSEN MCH. CO., RACINE, WIS.



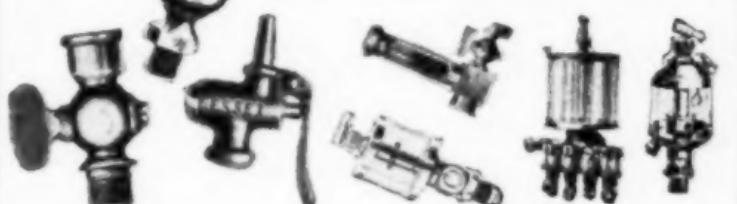
ESSEX LUBRICATING DEVICES

• Efficient - Dependable •

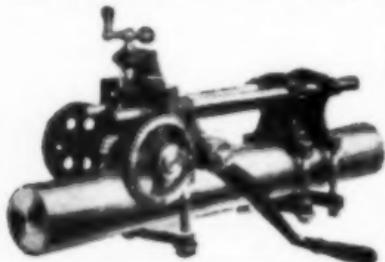
When you need lubricating equipment—from automatic lubricators to the tiniest grease cup—call on ESSEX. We can supply it, and 37 years of experience is at your disposal in solving any lubricating problem.

Write for Your Copy of ESSEX Catalog No. 7

ESSEX BRASS CORPORATION
2000 Franklin St., Detroit, Mich.

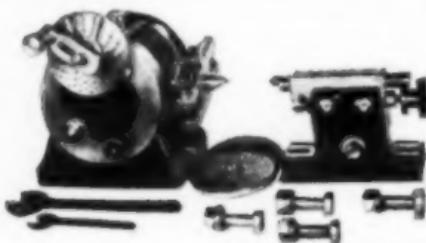


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Indispensable for repair and maintenance work. BURR keyseaters mill keyways in the run or on the ends of shafts while they are still on the machine—accurately, quickly, economically—and save the necessity of taking down large shafts and housings. Made in 7 sizes, hand or power driven.

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CARROLL Universal Dividing Heads

Twenty Years of Popularity.
6-inch, 10½-inch and 12-inch swing. Furnished either Right or Left hand type, for all makes of plain or universal milling machines.

See your Dealer or write for bulletin showing complete line.

LET US RIVET YOUR SAMPLES

If a cold riveting problem is confronting you, why bother your head about it? Just get together several assemblies and a quantity of loose rivets and send them along to Riveting Headquarters. We will rivet and return them promptly together with guaranteed production time.

There's a "High-Speed" for any rivet from the smallest to 2½" diameter—10 sizes in all.

Write or send samples, no obligation whatever

High Speed Hammers for Riveting, Flanging, Flattening, Swaging

High Speed Hammer Company, Inc.
311 Norton St., Rochester, N. Y.



Gusher Coolant Pump

A Complete, Portable Unit



This portable pump and tank combination is a complete pumping unit, easily moved about and always ready for use. Ball bearing motor delivers steady volume at low pressure.

Gusher pumps need no priming, have no foot valves and are so constructed that chips and abrasives pass through them without injuring the mechanism. Centrifugal seal eliminates packing.

There's a Ruthman pump for your machines. Send today for information

The Ruthman Machinery Co.
538 E. Front St., Cincinnati, Ohio

SPEED LATHES

Timesavers for your plant



Hand, foot or air operated 3-jaw chucks.

Hand or Foot operated collet, sizes from $\frac{1}{64}$ " to $1\frac{1}{4}$ ".

1, $\frac{1}{2}$ or $\frac{1}{4}$ h. p. AC 2 speed motor.

Steel bed plate or hand rest optional.

Just the tools for Finishing, Polishing or Lapping of small parts.

THE very tools you've been looking for to produce those small parts quickly and economically. Eliminates tying up larger equipment with its slow and make-shift production methods. Built-in features of this new tool allow you to handle rod, tube and chuck stock better than ever before.

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Cir. 351 Today

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GEARS

In Stock—Immediate Delivery

Gears, speed reducers, sprockets, thrust bearings, flexible couplings, pulleys, etc. A complete line is carried in our Chicago stock. Can also quote on special gears of any kind. Send us your blue prints and inquiries.

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Chicago Gear Works, 769 W. Jackson Blvd.
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For Machine and Tool Work and Quick Set-Ups

Use Reich's—the only 3 way reading precision Indicator



Contact point mounted in centered cone bearings. .014 reading. Order direct or through your dealer.

Price \$5.00

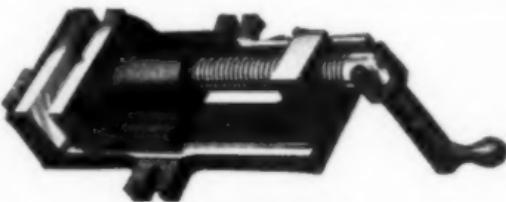
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J. R. REICH MFG. CO.
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Eliminate Special and Costly Drill Jig Fixtures

By Using YOST
Drill Press Vises

Heavily constructed,
with flanges on base
for easy attachment.
"V" shaped slot holds
vertical work securely.



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TEMCO PORTABLE ELECTRIC DRILLS

Will give you more power and
performance at a lower price.

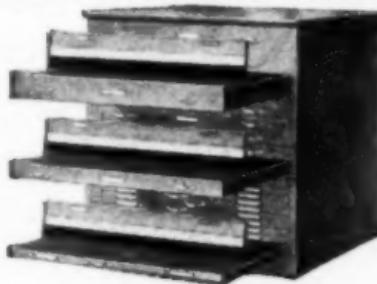
Made in $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ " capacities.

Write for complete information and prices.

TEMCO ELECTRIC MOTOR CO.
Leipsic, Ohio

NEW! HAMILTON-CALUMET ROLL TRACING FILES

A new type of roll tracing file. Available in ten sizes to accommodate 1", 2", and 3" rolls in lengths from 30" to 48". Rolls are not damaged when removed or replaced and they are fully protected from dust and rodents. The illustration shows the file opened with self-indexing compressors opened. When closed, the compressor holds the roll securely in place. A rear hood guards the back end of the roll, and rubber coated dust protector automatically drops into place when compressor is down.



Investigate this latest Hamilton filing achievement. Use the coupon.

HAMILTON MANUFACTURING CO.

Two Rivers, Wisconsin
Dept. H-11-37

Please send me complete information on your
Hamilton-Calumet Roll Tracing Files.

Name _____
Address _____
City _____ State _____

ROYERSFORD EXCELSIOR

POWER HACK SAW M-2-A

with V-Belt
Motor Drive

*A modern machine offering
many special advantages:*

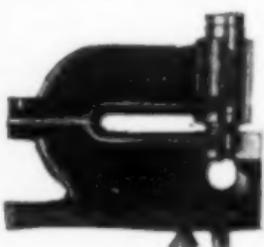
AUTOMATIC LIFT
AUTOMATIC SHUT-OFF
GRAVITY FEED
SWIVEL VISE
MOTOR DRIVE THROUGH
MILLED GEARS



We also make Up-right Power Drills,
Polishing Machines, Foot Pres-
ses, etc. Send for
full information.
Dealers Wanted.

ROYERSFORD FOUNDRY & MACHINE CO.
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WALES ADJUSTABLE HOLE PUNCHING DIES



are individual sub-press type units which can be mounted in groups to punch almost any arrangement of holes in flat sheets. Operate in press or press brake. Capacity of standard dies $\frac{1}{8}$ " holes in 14 gauge or under. Also square and Vee notching dies.

Write for Bulletin A

THE STRIPPIT CORPORATION
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Cuts a Clean Sheared Edge Without Knurl or Distortion

Two Sizes—No. 1 weighs 16½ lbs., cuts up to 14 gauge. No. 2 weighs 32 lbs., cuts up to 10 gauge.

Priced low—Send for free circular

Beverly Throatless Shear Co.
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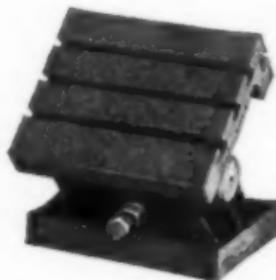
McMAHON Adjustable Angle Plate

For grinding any angle accurately.

Made in two sizes

Model "A" with T slots 3½x3½... Price \$12.
Model "D" with tap hole 6x7½... Price \$30.

Desirable territory open for dealers
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Ask for catalog RW illustrating a great many shapes and sizes of rotary files and rasps.

Ask also for catalog NW, illustrating more than 4000 different precision Swiss files.

GROBET FILE CORP. OF AMERICA
3 Park Place, New York City

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RED HEAD

ETCHERS and DEMAGNETIZERS

New d. c. and a. c. models now available.

SEND FOR LATEST CIRCULAR

**PRINTZ
ELECTRIC CO.
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3 TOOLS IN 1

**Etches-Demagnetizes-
Anneals**

THE LUMA is a compact, handy, portable tool—an electric pencil for marking hardened and ground steel—a thorough demagnetizer—a carbon point for light annealing and soldering. Easy to use—plugs in any light socket. Effects surprising savings.



Luma Marking and
Demagnetizing SIMULTANEOUSLY

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**LUMA ELECTRIC EQUIPMENT CO.
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THE CHAMPION LINE



Toolholders, Expanding Mandrels,
Shop Furniture, Emery Wheel Dressers
and Cutters, Etc., Etc.

The Western Tool & Manufacturing Co., Springfield, O.

WHY NOT MODERNIZE



RUSSELL BORING BAR CO.
MIDDLETOWN,

OHIO

your present equipment, by using the RUSSELL BORING BAR? Bores holes from $9/16^{\prime\prime}$ to $12^{\prime\prime}$ dia. with axis of boring bar parallel to axis of the shank, in one compact tool, with micrometer adjustment.

Ask for illustrated folder.

● USE LAYOUT FLUID ●



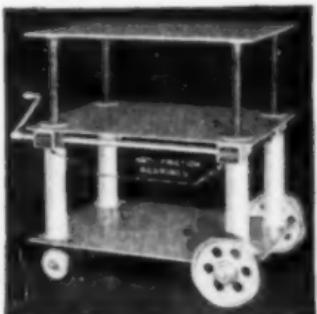
for general machine shop and tool room use on dies, jigs, fixtures, and machined parts.

With the use of the die blue layout fluid, you do not have to polish the surface of work. Simply wipe surface fairly clean and brush on. DRIES INSTANTLY.

Write for free shop sample on your letterhead.

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Using Hamilton Elevating Tables

in your tool room or stamping shop, one man will handle dies that formerly required two to three men to lift. Send for our illustrated circular and see for yourself the many jobs to which this handy tool adapts itself.

The Hamilton Tool Co.
Hamilton, Ohio, U. S. A.

PIONEERS IN RIVET SPINNING

For 35 years Grant rivet spinners have proved in daily use their superiority to other riveting machines.

Noiseless spinning or vibrating hammer types for sizes from smallest to $\frac{3}{8}$ " diameter. Horizontal and vertical single and multiple spindle machines produce best quality riveting at high speed.

Send samples for test when you write for information.



GRANT MFG. & MACHINE CO.
C. E. STATION, BRIDGEPORT, CONN.

MULTI-PURPOSE POLISHER



Do Your

polishing, surfacing, disc grinding, etc., all on one machine the "PRODUCTION" Type R. Saves space improves work cuts time and costs.

Many other types of polishing machines available.

Write for circulars.

PRODUCTION MACHINE CO.
GREENFIELD, MASS.



ROGERS Circular Knife Grinder

Grind Your Circular Knives at Low Cost

For circular or rotary knives up to 20" diameter. By means of triple slides and swiveling adjustment any degree of bevel can be ground. Graduated dial insures correct bevel angle setting. Unusually low price. Write for bulletin CC.

S. C. ROGERS & COMPANY

205 Dutton Ave. Buffalo, N. Y.

Makers of Knife Grinders For 50 Years

Type "CC"



**WIREGRIP
BELT HOOKS**

Now you can get your belt hooks on processed card (Pat. Applied For). Not only protects fingers from sharp hooks but holds them to the last hook in correct position. There's no card end waste with WIREGRIP—easily cut to size with scissors or knife. Coming in all sizes, easily applied with a WIREGRIP Lacer or any other standard lacing machine.

Write for No. 10 Catalog

ARMSTRONG-BRAY & CO.

"The Belt Lacing People"

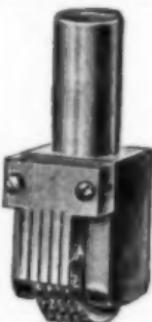
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MARK IT QUICKLY

with a

NUMBERALL Numbering Machine

Hand or Press Style for stamping fibre, metals and untempered steel.



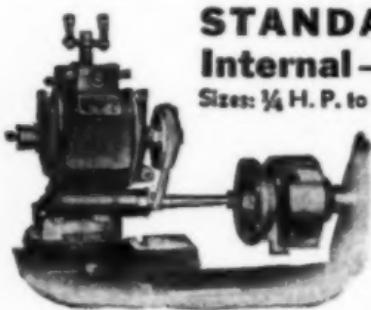
1 to 10 wheels
Non-Automatic
Quick Change,
and Automatic.

Write for latest
circulars and
price lists

NUMBERALL STAMP & TOOL CO.
Huguenot Park, Staten Island, N. Y.

STANDARD Combination Internal—External Grinder

Sizes: $\frac{1}{4}$ H. P. to 3 H. P. Speeds up to 20,000 R.P.M.



WRITE FOR CATALOG showing
Bench and Floor Grinders, Disc
Grinders, Buffing and Polishing
Lathes, Electric Drills, etc.

**The Standard
Electrical Tool Co.**

1932 W. 8th St., Cincinnati, Ohio.



The "BUTTERFLY" Filing and Die Making Machine

Saves cost in sawing, filing and lapping on dies, gauges, tools, etc.

In highest possible quality of material, precision of machining and nicety of adjustments, the "BUTTERFLY" Filing Machine is as painstaking a product as the finest watch movement—and just as reliable.

NOISELESS IN OPERATION

Made in its entirety under the direct personal supervision and exacting standards of the well recognized and able engineer, Leonard Markels. All parts are interchangeable.

Write for folder C. and E. L.

Named "BUTTERFLY" because it is as noiseless in its running as a Butterfly is in its flying.

HARVEY MANUFACTURING CORP.
MANUFACTURING PLANT AND
EXECUTIVE OFFICES

161 GRAND ST. :— NEW YORK, N. Y.

BEFORE BUYING...



Check These Vital Points:

- 1—Size and shape of bearing block?
- 2—Overhang or distance from shank to boring bars?
- 3—Simple or complicated design?
- 4—Accuracy and readability of dial screw?
- 5—Range of boring jobs?

- 6—Are boring bars, wrenches, etc. included?
- 7—Is the price reasonable?

CRALEY OFF-SET BORING HEADS
meet all your requirements. Made in 7 sizes for everything from the smallest holes up to 20" diameter.

Write for full information.

C. C. Craley Mfg. Co., Shillington, Pa.



FASTER, MORE POWERFUL GRINDER

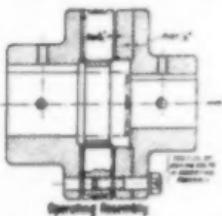
Wt. 5 lbs.
Air Driven

38,000 R.P.M.
1/2 H.P.

Saves grinding time. New Onsrud air-turbine Grinder provides extra power for heavy cuts. Speeds work. Gives extra smooth finish. Always runs cool. Vibrationless. Beautifully balanced. *Circular on request.*

ONSRUD MACHINE WORKS, Inc.
Pioneer Builders of High Speed Air Turbines
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SET or TIME Engine Without Teardown!



L-R FLEXIBLE COUPLING—Type WQ

Loosen a few screws—that's all. Write for details of this brand new addition to the L-R Flexible Coupling time and labor saving line.

Lovejoy Flexible Coupling Co.
5026 W. Lake St., Chicago, Ill.

LAUBER

Patented

Die-Cast File Handles



- Heavy Ferrule die cast directly on hard wood.
- Can't turn or become loose.
- Holds file firmly.

*Mrs. agents—
Write for territory*

The Lauber Co.
3240 W. National Ave.
MILWAUKEE, WIS.



TANNEWITZ Abrasive Cut-off Machine

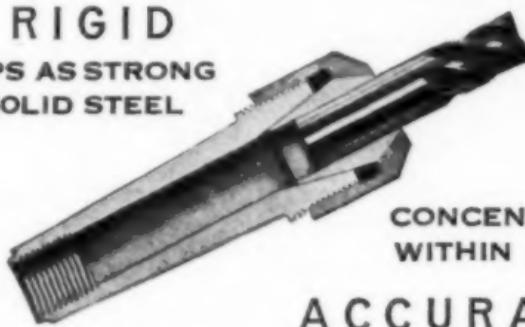
Uses Abrasive Wheels or Saws, and instantly swivels and cuts any angle from 45° left to 45° right, doing clean, instantaneous work on metal bars, shapes or tubes.

THE TANNEWITZ WORKS
GRAND RAPIDS, MICH.

UNIVERSAL COLLET CHUCKS

RIGID

GRIPS AS STRONG
AS SOLID STEEL



CONCENTRIC
WITHIN .001

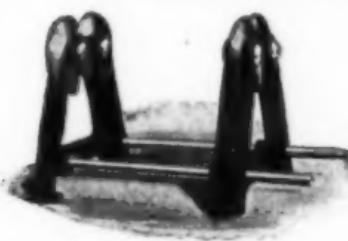
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UNIVERSAL ENGINEERING CO.

FRANKENMUTH, MICHIGAN

ANDERSON Improved Balancing Ways



Four Chilled iron discs
rotate on sensitive
special bearings.

No Leveling Required

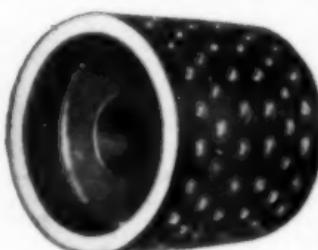
A simple and excellent
device for balancing
straightening and
truizing.

Write for Full Information

Anderson Bros. Mfg. Co.
1907 Kishwaukee Street,
ROCKFORD, ILLINOIS

Swing	Greatest Distance Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000

Vacuum Cup Metal Pulley



Revolutionizes pulley performance. The only pulley on the market with the vacuum principle. Guaranteed to eliminate slippage and increase life of belts and equipment. Adaptable for short center drives. Write for descriptive folder. Sent on 30 days' trial. Motor pulleys and pulleys up to 72" diameter.

**VACUUM CUP METAL PULLEY CO.
INC.**

12536 Grand River Ave.,

Detroit, Mich.



40 TYPES OF MEYLAN STOP WATCHES

*A watch for
every purpose*

Ask for FREE
folder No. 11H fully illustrating and
describing some 40 types of stopwatches.
No salesmen will call.

REPAIR SERVICE

for all kinds of plain and complicated
stopwatches. Send to us for estimates;
no charge, no obligation.

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"Specialists in timing instruments"

266-68 West 40th St.,

New York City

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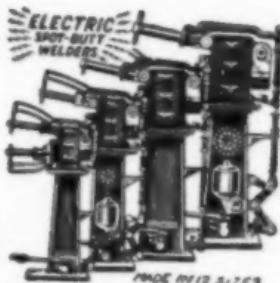
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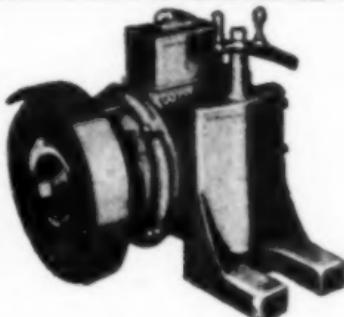
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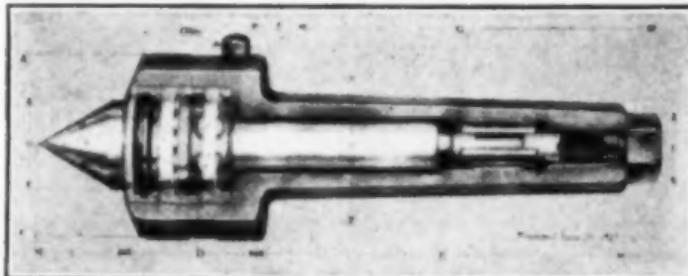
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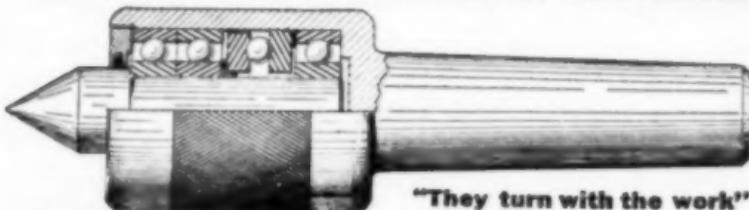
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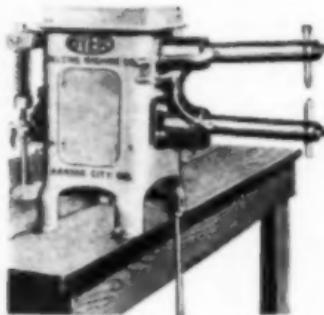
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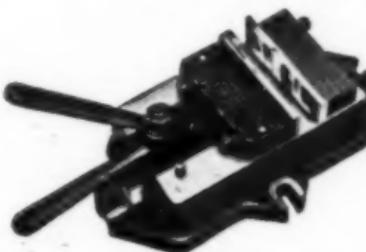
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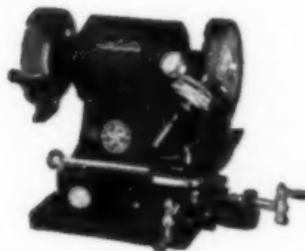
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- Baling Presses**
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Oliver Machinery Co., Grand Rapids, Mich.
Tannowitz Works, Grand Rapids, Mich.
Wells Mfg. Co., Three Rivers, Mich.
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General Blower Co., 401 N. Faeria St., Chicago
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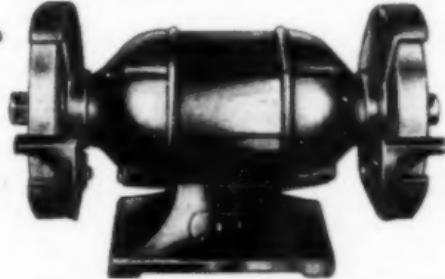
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Strippit Corp., Buffalo, N. Y.

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Roebach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

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Dressers, Angle Tangent to Radius

Vince Tool Co., Detroit, Mich.

Dressers, Emery Wheel

Oliver Motorcraft Corp., 2532 S. Wabash, Chicago

Drills and Taps

Etco Tool Co., 534 Johnson Av., Brooklyn, N. Y.

Drill Bushings

Acme Industrial Co., 210 N. Laflin St., Chicago, Ill.
Universal Eng. Corp., Frankensmuth, Mich.

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Roter A.R. Tool Co., Cleveland, O.

Drills, Electric

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SpeedWay Mfg. Co., 1822 So. 52nd Ave., Cicero, Ill.
Standard Electrical Tool Co., Cincinnati, O.
Temco Electric Motor Co., Leipsic, Ohio
Wodack Electric Tool Corp., 4629 W. Huron St., Chicago, Ill.

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Rockford Drilling Mfg. Co., Rockford, Ill.
Royersford Foundry & Machine Co., Royersford, Pa.

Drives, Lathe

Culmann Wheel Co., 1388 Altgeld St., Chgo.
Hardinge Brothers, Inc., Elmira, N. Y.

Drum Controllers, Reversing

Furnas Electric Co., West Allis, Wis.

Drum Controllers, Speed Changing

Furnas Electric Co., West Allis, Wis.

Electric Motors with Integral Brakes

Star Mfg. & Eng. Co., Bloomfield, N. J.

Electrical Instruments

Illinois Testing Laboratories, Inc., 160 W. Austin Ave., Chicago

Elevating Tables

Hamilton Tool Company, Hamilton, Ohio
Midwest Tool & Engineering Co., Dayton, O.

Emery Stands

Carroll Mfg. Co., L. W., Cincinnati, O.

Emery Wheel Dressers and Cutters

Desmond Stephan Mfg. Co., Urbana, Ohio
Oliver Motorcraft Corp., 2532 S. Wabash, Chicago

Western Tool & Mfg. Co., Springfield, O.

End Mills

Progressive Tool & Cutter Co., Ferndale, Mich.
Putnam Tool Co., Detroit, Mich.

Etching Machines, Electric

Brewster Co. William, 60 Church St., N.Y.C.
Luma Electric Equipment Co., Toledo, Ohio
Printz Electric Co., Detroit, Mich.

Exhaust Blowers

Buffalo Fans Co., Buffalo, N. Y.

Expansion Plugs

Wrought Washer Mfg. Co., Milwaukee, Wis.

Experimental Work

American Tool Works, Inc., Hartford, Conn.

Feeder Tubes

Sutton Tool Co., Detroit, Mich.

Feed Fingers

Morrison Mach. Products, Inc., Elmira, N. Y.

Feed Fingers for Auto. Screw Mch.

Modern Collar & Machine Co., Escanaba, Mich.
Sutton Tool Co., Detroit, Mich.

Files

Grobet File Co., 8 Park Place, New York City

Files, Rotary

Ford Mfg. Co., Davenport, Iowa
Rotary File Co., Detroit, Mich.
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Filing Machines

Continental Mch. Specialties, Minneapolis
Grob Bros., West Allis, Wis.
Harvey Mfg. Co., 161 Grand St., New York
Oliver Instrument Co., Adrian, Mich.

Filing Room Equipment

Wardwell Manufacturing Co., Cleveland, O.

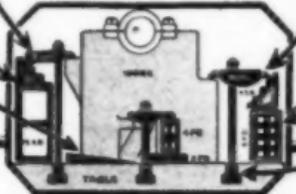
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Lovejoy Flex. Coupling Co., 5230 Lake, Chgo.

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Flexible Shafts and Accessories

American Rotary Tool Co., Inc., 44 Whitehall St., New York, N. Y.
Mail Tool Co., 7742 S. Chicago Ave., Chicago
Wyzanbook & Staff, Inc., 642 Washington Blvd., Chicago

Flexible Shaft Couplings

Leverjoy Flex Coupling Co., 5026 Lake, Chicago
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Flexible Shaft Machinery

Hastings Co., R. G., 4654 W. Fulton, Chicago
Mail Tool Co., 7742 S. Chicago Ave., Chicago
Pratt & Whitney, Hartford, Conn.
Walker-Turner Co., Plainfield, N. J.
Wyzanbook & Staff, Inc., 642 Washington Blvd., Chicago

Floating Holders

Gairing Tool Co., Detroit, Mich.

Flux Lathes

Marshalltown Mfg. Co., Marshalltown, Ia.

Flux Welders

Marshallton Mfg. Co., Marshalltown, Ia.

Forgings, Hollow Bored

American Hollow Boring Co., Erie, Pa.

Forming Tools

Banner Mfg. Co., 1878 Clybourn Av., Chicago
Michigan Tool Co., Detroit, Mich.

Furniture, Machine Shop

Standard Pressed Steel Co., Jenkintown, Penna.
Western Tool & Mfg. Co., Springfield, U.

Gages

Chicago Dial Indicator Co., 180 Wacker Drive, Chicago

Federal Products Corp., Providence, R. I.

Sheffield Gage Co., Dayton, U.

United Precision Products Co., 4618 W.

Huron St., Chicago

Gages, Chrome Plated

Vince Tool Co., Detroit, Mich.

Gages, Gears, Spur and Helical

Vince Tool Co., Detroit, Mich.

Gages, Pin, Plug, Ring and Snap

American Tool Works, Inc., Hartford, Conn.

Sheffield Gage Co., Dayton, U.

Standard Gear Co., Poughkeepsie, N. Y.

United Precision Products Co., 4618 W.

Huron St., Chicago

Gages, Pressure

Marshalltown Mfg. Co., Marshalltown, Ia.

Gages, Special

Sheffield Gage Co., Dayton, U.

Standard Gage Co., Poughkeepsie, N. Y.

Gages, Taper

Hartford Special Mfg. Co., Hartford, Conn.

Sheffield Gage Co., Dayton, U.

Vince Tool Co., Detroit, Mich.

Gears

Albert Gear & Mch. Co., 4832 W. 16th St.,

Cicero, Ill.

Chicago Gear Works, 700 W. Jackson, Chicago

Taylor Machine Co., Cleveland, Ohio

Gears, Master

Vince Tool Co., Detroit, Mich.

Gear Motors

Star Mch. & Eng. Co., Bloomfield, N. J.

Generators

Chicago Electric Co., 1886 W. 22nd St.,

Chicago, Ill.

Janette Mfg. Co., 552 W. Monroe St., Chicago

Star Mch. & Eng. Co., Bloomfield, N. J.

Grease Cups

Enox Brass Corp., Detroit, Mich.

Grinders, Air

M-B Products, Detroit, Mich.

Onarod Machine Works, Inc., 2906 Palmer

St., Chicago

Rotor Air Tool Co., Cleveland, O.

Grinders, Bench

Baldor Electric Co., St. Louis, Mo.
Carroll Mfg. Co., L. W., Cincinnati, O.
Valley Electric Corp., St. Louis, Mo.
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders, Disc

Oliver Machinery Co., Grand Rapids, Mich.
Wyzanbook & Staff, Inc., 642 Washington Blvd., Chicago

Grinders, Electric

Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago, Ill.
Dremel Mfg. Co., Racine, Wis.
Skilaw, Inc., 3304 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.
Wodack Electric Tool Corp., 4629 W. Huron St., Chicago

Grinders, Flexible Shaft

Hastings Co., R. G., 4654 W. Fulton St., Chicago
Mail Tool Co., 7742 S. Chicago Ave., Chicago
H. A. Strand & Co., 5801 N. Wolcott, Chicago

Grinders, Hand

Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago, Ill.
Dremel Mfg. Co., Racine, Wis.
Dumore Co., Racine, Wis.

M-B Products, Detroit, Mich.
Rotor Air Tool Co., Cleveland, O.
Skilaw, Inc., 3304 Elston Av., Chicago, Ill.
Wodack Electric Tool Corp., 4629 W. Huron St., Chicago

Grinders, Heavy Duty

Queen City Machine Tool Co., Cincinnati, O.
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders, High Speed

Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago, Ill.
Dremel Mfg. Co., Racine, Wis.
Dumore Co., Racine, Wis.

Mail Tool Co., 7742 S. Chicago Ave., Chicago
M-B Products, Detroit, Mich.
Walker-Turner Co., Plainfield, N. J.

Grinders, Pedestal Electric

Baldor Electric Co., St. Louis, Mo.
Queen City Machine Tool Co., Cincinnati, O.
Valley Electric Corp., St. Louis, Mo.

Grinders, Swing Frame

Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders and Polishers, Belt

Oliver Machinery Co., Grand Rapids, Mich.
Boyersford Foundry & Machine Co.,
Boyersford, Pa.

Grinders, Tool Post

Wodack Electric Tool Corp., 4629 W. Huron St., Chicago

Grinding Attachments, Drill

Atlas Press Co., Kalamazoo, Mich.
Carlson Mfg. Co., C. H., Minneapolis, Minn.
Oliver Instrument Co., Adrian, Mich.

Grinding, Centerless (Contract)

Commercial Centerless Grinding Co., 6538 Carnegie Ave., Cleveland, Ohio
Industrial Centerless Grinding Co., Detroit
Fetter Machine Co., Cincinnati, O.

Grinding Machine Attachments

Berkley Engineering Co., Cleveland, O.

Grinding Machines, Belt

Armaglo Co., Milwaukee, Wis.
Production Machine Co., Greenfield, Mass.
Walsh Sales Corp., 96 Warren St., New York

Grinding Machines, Cutter, Reamer and Tool
Brown & Sharpe Mfg. Co., Providence, R. I.
Gallmeyer & Livingston Co., Grand Rapids, Mich.

National Machine Tool Co., Racine, Wis.
Oliver Instrument Co., Adrian, Mich.
Roger & Co., Buffalo, N. Y.

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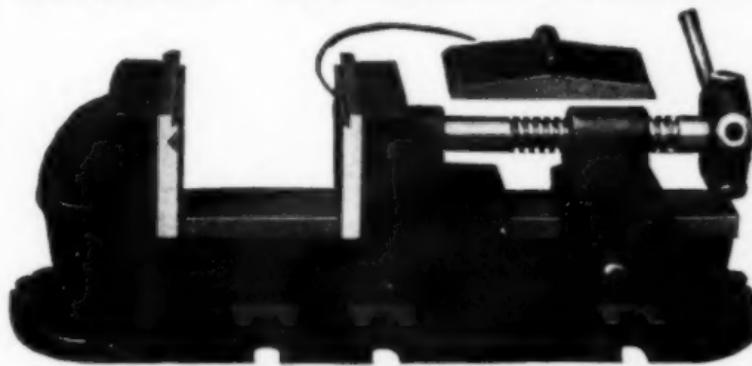
Chicago, U. S. A.

New York — Philadelphia — Boston — Pittsburgh — Milwaukee

Classified Finding Index

- Grinding Machines, Floor**
Queen City Machine Tool Co., Cincinnati, O.
Standard Electrical Tool Co., Cincinnati, O.
- Grinding Machines, Internal**
Dumore Co., Racine, Wis.
National Machine Tool Co., Racine, Wis.
Omarud Machine Works, Inc., 5906 Palmer
St., Chicago
- Grinding Machines, Portable Electric**
Chicago Wheel & Mfg. Co., 1101 W. Monroe
St., Chicago, Ill.
Dremel Mfg. Co., Racine, Wis.
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Haskins Co., R. G. 4654 W. Fulton, Chicago
Mall Tool Co., 7742 S. Chicago Ave., Chicago
National Machine Tool Co., Racine, Wis.
Pratt & Whitney, Hartford, Conn.
Strand Co., N. A., 5001 N. Wolcott St., Chicago
White Dental Mfg. Co., 10 E. 46th Street,
New York, N. Y.
- Grinding Machines, Surface**
Gallmeyer & Livingston Co., Grand Rapids
- Grinding Machines, Tap**
Gallmeyer & Livingston Co., Grand Rapids
- Grinding Machines, Tool**
Rogers & Co., Buffalo, N. Y.
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Brown & Sharpe Mfg. Co., Providence, R. I.
- Grinding Wheels**
Chicago Wheel & Mfg. Co., 1101 W. Monroe
St., Chicago, Ill.
- Grinding Wheels, Mounted**
Chicago Wheel & Mfg. Co., 1101 W. Monroe
St., Chicago, Ill.
- Grinding Wheels On Shanks**
Chicago Wheel & Mfg. Co., 1101 W. Monroe
St., Chicago, Ill.
- Hack Saw Blades**
Armstrong-Blum Mfg. Co., 5741 Bloomingdale Ave., Chicago
- Hack Saw Machines**
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Wells Mfg. Corp., Three Rivers, Mich.
- Hammers, Electric**
Wedack Electric Tool Corp., 4629 W. Huron
St., Chicago, Ill.
- Hammers, Timers**
Whitney Mfg. Co., W. A., Rockford, Ill.
- Hammers, Mallets and Malls**
Chicago Hawkhead Mfg. Co., 1200 Elston Av.,
Chicago, Ill.
- Hammers, Riveting**
High Speed Hammer Co., Rochester, N. Y.
- Hammers, Soft Faced**
Greene Tweed & Co., 109 Duane St.,
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- Hand Punches**
Whitney Mfg. Co., W. A., Rockford, Ill.
- Hand Saws, Portable Electric**
Skilow, Inc., 3304 Elston Av., Chicago, Ill.
- Hand Screw Machines, Precision**
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Hardinge Brothers, Inc., Elmira, N. Y.
- Hangers**
Chicago Die Casting Mfg. Co., 2502 W.
Monroe St., Chicago, Ill.
- Heads, Boring**
Pynn Manufacturing Co., Detroit, Mich.
- Hobs**
Michigan Tool Co., Detroit, Mich.
- Hole Cutters**
Wyman & Sons, Inc., 642 Washington
Bld., Chicago
- Hollow Adjustable Mills**
Gairing Tool Co., Detroit, Mich.
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Standard Pressed Steel Co., Jenkintown,
Pa.
- Hydraulic Valves**
Galland-Henning Mfg. Co., Milwaukee, Wis.
Hanna Engineering Works, 1765 Elston
Ave., Chicago, Ill.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
- Index Centers**
Brown & Sharpe Mfg. Co., Providence, R. I.
Wm. Carroll & Son, Norwood, Cincinnati, O.
- Indicator Holders**
Chicago Dial Indicator Co., 189 Wacker
Drive, Chicago
- Indicators, Dial**
Chicago Dial Indicator Co., 189 Wacker
Drive, Chicago
- Standard Gage Co., Inc., Poughkeepsie, N. Y.**
- Indicating Dials**
Federal Products Corp., Providence, R. I.
- Indicators, Speed**
Greene Tweed & Co., 109 Duane St.,
New York, N. Y.
- Indicators, Surface Test**
Reich Mfg. Co., J. R., Dayton, Ohio
- Jigs and Fixtures**
American Tool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Hamilton, Ohio
Hartford Special Mfg. Co., Hartford, Conn.
Henderson & Kaye, Batavia, Ill.
Blowey Tool Co., Detroit, Mich.
- Keyseating Machines**
Burr & Son, John T., Brooklyn, N. Y.
- Knife Grinders**
Rogers & Co., Buffalo, N. Y.
- Knurl and Holders, for Turrets**
Graham Manufacturing Co., Providence, R. I.
- Lathe Centers**
Modern Mfg. Corp., Brooklyn, N. Y.
Nielsen, Inc., Lawton, Mich.
Hardi Bros. Tool Holder Co., Detroit, Mich.
Sturdimate Tool Co., Detroit, Mich.
- Lathe Drives**
Berkeley Engineering Co., Cleveland, O.
Cullinan Wheel Co., 1859 Altgeld St., Chicago
Hardi Bros. Tool Holder Co., Elmira, N. Y.
- Lathe, Automatic**
Jones & Lamson Mfg. Co., Springfield, Vt.
- Lathe, Bench**
Atlas Press Co., Kalamazoo, Mich.
Delta Mfg. Co., Milwaukee, Wis.
Hardinge Brothers, Inc., Elmira, N. Y.
Rivett-Latho Grinder Inc., Brighton, Boston
South Bend Lathe Works, South Bend, Ind.
- Lathe, Back Guard**
Rivett Latho & Grinder Inc., Brighton, Boston
South Bend Lathe Works, South Bend, Ind.
- Lathe, Brake Drum**
South Bend Lathe Works, South Bend, Ind.
- Lathe, Engine**
Ryerson & Son, Inc., 10th & Rockwell St.,
Chicago, Ill.
South Bend Lathe Works, South Bend, Ind.
Western Machine Tool Works, Holland, Mich.
- Lathe, Polishing and Buffing**
Standard Electrical Tool Co., Cincinnati, O.
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South Bend Lathe Works, South Bend, Ind.

Lathes, Screw Cutting

South Bend Lathe Works, South Bend, Ind.

Lathes, Speed

Schauer Machine Co., Cincinnati, Ohio

Lathes, Toolroom

South Bend Lathe Works, South Bend, Ind.

Lathes, Turret

Jones & Lamson Mfg. Co., Springfield, Vt.

Layout Plates

Challenge Mfg. Co., Grand Haven, Mich.

Layout Tables

Parsons-Merritt Co., Van Dyke, Mich.

Leader Pins, Steel

Atmo Industrial Co., 419 N. Carpenter St., Chicago, Ill.

Leather Belting, All Types

Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Leather Oil Retainers

Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Leather Pkg., Hydraulic & Pneumatic

Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Live Lathe Centers

Modern Mfg. Corp., Brooklyn, N. Y.
Sturdimate Tool Co., Detroit, Mich.

Lubricators, Air

Mass Brass Corp., Detroit, Mich.
Norgren C. A., Denver, Colorado

Lubricators, Automatic

Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.
Greene Tweed & Co., 100 Duane St.,
New York, N. Y.

M-B Products Co., Detroit, Mich.
Norgren Co., C. A., Denver, Colo.

Mandrels, Expanding

W. H. Nicholson & Co., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, O.

Mandrels, Saw and Grinding

Chicago Die Casting Mfg. Co., 2502 W.
Monroe St., Chicago, Ill.

Marking Machines

Schmidt, Geo. T., Inc., 1802 Belle Plain
Ave., Chicago, Ill.

Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Cincinnati, Ohio
Wm. Carroll & Son, Norwood, Cincinnati, O.

Milling Attachments

Master Machine & Tool Co., North Kansas
City, Mo.

Milling Machine Attachments

Berkley Engineering Co., Cleveland, O.

Milling Machines, Bench

Burke Machine Tool Co., Cincinnati, Ohio
Hardinge Brothers, Inc., Elmira, N. Y.

Milling Machines, Precision Bench

Hardinge Brothers, Inc., Elmira, N. Y.
Ryerson & Son, Inc., 16th & Rockwell St.,
Chicago, Ill.

Milling Machines, Hand

Burke Machine Tool Co., Cincinnati, Ohio

Milling Machines, Universal

Brown & Sharpe Mfg. Co., Providence, R. I.

Milling Machines, Plain

Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Cincinnati, Ohio

Motors

Chicago Electric Co., 1228 W. 22nd St.,
Chicago, Ill.

Jansette Mfg. Co., 552 W. Monroe St., Chgo.

Motors, Small Universal

Dremel Mfg. Co., Racine, Wis.

Speedway Mfg. Co., Cicero, Ill.

Motor-Generator Sets

Chicago Electric Co., 1228 W. 22nd St.,
Chicago, Ill.

Jansette Mfg. Co., 552 W. Monroe St., Chgo.

Motor Drives, Universal

Berkley Engineering Co., Cleveland, O.

Culman Wheel Co., 1250 Alvarado St., Chgo.

Stege Machinery Co., 18 S. Clinton St.,
Chicago, Ill.

Motors, Electric Ball Bearing

Valley Electric Corp., St. Louis, Mo.

Motor Starters

The Lincoln Electric Co., Cleveland, O.

Moulds & Ladies, Hammer and Vice.

Johnson Tool Co., East Providence, R. I.

Multiple Oilers

Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Nibbling Machines

Libert Machine Co., Green Bay, Wis.

National Machine Tool Co., Racine, Wis.

Nitrided Products

Universal Eng. Corp., Frankfort, Mich.

Numbering Machines

Numberam Stamp & Tool Co., Staten Island,
N. Y.

Oil Cups

Emex Brass Corp., Detroit, Mich.

Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Oil Gauges

Emex Brass Corp., Detroit, Mich.

Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Oil and Grease Seals

Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Operating Valves

Galland-Henning Mfg. Co., Milwaukee, Wis.

Packing, Hydraulic

Chicago Rawhide Mfg. Co., 1200 Elston Av.,
Chicago, Ill.

Packings, Steam

Greene Tweed & Co., 100 Duane St.,
New York, N. Y.

Pillow Blocks

Chicago Die Casting Mfg. Co., 2502 W.
Monroe St., Chicago, Ill.

Pins and Lacing for Belting

Chicago Rawhide Mfg. Co., 1200 Elston Av.,
Chicago, Ill.

Pins, Leader And Dowel

Atmo Industrial Co., 419 N. Carpenter St.,
Chicago, Ill.

Baumbach Mfg. Co., E. A., 1812 So. Kil-
bourne Ave., Chicago

Pipe Cutters

Ridge Tool Co., Elyria, Ohio

Pipe Vises

Ridge Tool Co., Elyria, Ohio

Pipe Wrenches

Ridge Tool Co., Elyria, Ohio

Planing Machines

Ryerson & Son, Inc., 10th & Rockwell St.,
Chicago, Ill.

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Wittek Mfg. Co., 4309 W. 56th Place, Chicago.

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
Famco Machine Co., Racine, Wis.
Greenard Arbor Press Co., Nashua, N. H.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Wilson, K. R., Buffalo, N. Y.

Presses, Bench

Rockford Iron Works, Rockford, Ill.

Presses, Broaching

Greenard Arbor Press Co., Nashua, N. H.

Presses, Foot

Famco Machine Co., Racine, Wis.
Rockford Iron Works, Rockford, Ill.
Rogersford Foundry & Machine Co.,
Rogersford, Pa.

Presses, Forming

Marshalltown Mfg. Co., Marshalltown, Ia.

Presses, High Speed

Super Speed Press Corp., 55 Liberty St.,
New York, N. Y.

Presses, Inclinable

Federal Press Co., Elkhart, Indiana
Marshalltown Mfg. Co., Marshalltown, Ia.
Rockford Iron Works, Rockford, Ill.
Ross Co., David J., Benton Harbor, Mich.

Presses, Power

Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
Federal Press Co., Elkhart, Indiana
Rockford Iron Works, Rockford, Ill.

Presses, Punch

Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
Lawthwaite Mfg. Co., T.H., 8118-47th, N.Y.
Marshalltown Mfg. Co., Marshalltown, Ia.
Ross Co., David J., Benton Harbor, Mich.
Super Speed Press Corp., 55 Liberty St.,
New York, N. Y.

Presses, Sheet Metal

Federal Press Co., Elkhart, Indiana

Pullers, Gear and Wheel

Armstrong-Bray & Co., 815 N. Sheldon St.,
Chicago

Pulleys, Die Cast

Chicago Die Casting Mfg. Co., 2502 W.
Monroe St., Chicago, Ill.
Conway Clutch Co., Cincinnati, O.

Pulleys, Steel and Wood

Delta Mfg. Co., Milwaukee, Wis.

Pulleys, Vacuum Cup

Vacuum Cup Metal Pulley Co., Detroit

Pumps

Brown & Sharpe Mfg. Co., Providence, R.I.
Gulfco Specialties Co., Manchester, O.
Galland-Henning Mfg. Co., Milwaukee, Wis.

Pumps, Coolant

Gulfco Specialties Co., Manchester, O.
Bathman Machinery Co., Cincinnati, Ohio
Tomkins-Johnson Co., Jackson, Mich.

Pumps Lubricant

Bathman Machinery Co., Cincinnati, Ohio

Punch Press Guards

Ross Co., David J., Benton Harbor, Mich.

Punch, Shear and Bender, Hand

Armstrong-Blum Mfg. Co., 5741 Bloomingdale Ave., Chicago
Buffalo Forge Co., Buffalo, N. Y.

Punches and Dies

Whitney Mfg. Co., W. A., Rockford, Ill.

Punches, Hand

Armstrong-Blum Mfg. Co., 5741 Bloomingdale Ave., Chicago
Buffalo Forge Company, Buffalo, N. Y.
Lawthwaite Mfg. Co., T. H., 811 E. 47th St., New York
Whitney Metal Tool Co., Rockford, Ill.

Punches and Dies

Lawthwaite Mfg. Co., T. H., 811 E. 47th, N.Y.

Pusher Tubes

Modern Collet & Machine Co., Kooskia, Mich.

Pyrometers

Illinois Testing Laboratories, Inc., 150-W.
Austin Ave., Chicago
Pyrometer Instrument Co., 102-106 Lafayette St., New York City

Pyrometers, Optical

Pyrometer Instrument Co., 102-106 Lafayette St., New York City

Pyrometers, Portable & Stationary

Illinois Testing Laboratories, Inc., 150 W.
Austin Ave., Chicago, Ill.
Pyrometer Inst. Co., 102 Lafayette, N.Y.C.

Pyrometers, Surface

Illinois Testing Laboratories, 150 W. Austin Ave., Chicago, Ill.
Pyrometer Instrument Co., 102-106 Lafayette St., New York City

Racks, Bar Stock

Wm. S. Yohe Supply Co., Canton, O.

Rivets, Tubular and Split

Chicago Rivet & Machine Co., 1855 S. 54th St., Cicero P. O., Chicago, Ill.

Riveters, Automatic Feed

Chicago Rivet & Machine Co., 1855 S. 54th St., Cicero P. O., Chicago, Ill.

Riveters, Multiple Spindle

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Riveters, Pneumatic

Grant Mfg. & Mch. Co., Bridgeport, Conn.
Banes Engineering Works, 1763 Elston Ave., Chicago, Ill.

Riveting Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.
Banes Engine ring Works, 1763 Elston Ave., Chicago, Ill.

High Speed Hammer Co., Rochester, N. Y.
Higgs Bros. Co., Bridgeport, Conn.

Riveting Machines, Tubular and Split

Chicago Rivet & Machine Co., 1855 S. 54th St., Cicero P. O., Chicago, Ill.

Rod Cutters

Armstrong-Blum Mfg. Co., 5741 Bloomingdale Ave., Chicago

Lawthwaite Mfg. Co., T. H., 811 E. 47th, N.Y.

Router Bits

American Rotary Tools Co., Inc., 44 Whitehall St., New York, N. Y.

Putnam Tool Co., Detroit, Mich.

Sanders

Motor Air Tool Co., Cleveland, O.
Standard Electrical Tool Co., Cincinnati, O.

Saws, Electric Hand

Delta Mfg. Co., Milwaukee, Wis.

Saw Sharpening Machines

Roger & Co., Buffalo, N. Y.
Wardwell Manufacturing Co., Cleveland, O.

Sawing Machines

Continental Mch. Specialties, Minneapolis
Delta Mfg. Co., Milwaukee, Wis.

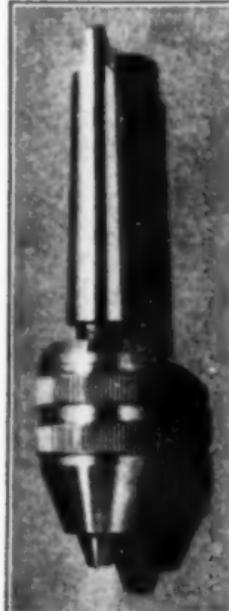
Grob Brothers, Grafton, Wis.
Haasemann Machine Co., Racine, Wis.
Wells Mfg. Co., Three Rivers, Mich.

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Modern Collet & Machine Co., Ecorse, Mich.

Screw Machine Tools
Banner Mfg. Co., 1873 Clybourn Av., Chgo.

Screw Machines, Automatic
Brown & Sharpe Mfg. Co., Providence, R.I.

Screws

Standard Pressed Steel Co., Jenkintown, Pa.
Triplex Screw Co., Cleveland, Ohio

Set-Up Appliances

Standard Shop Equip't. Co., Inc., Phila., Pa.

Shafts, Flexible
R. G. Haskins Co., 464 W. Fulton, Chicago
Pratt & Whitney, Hartford, Conn.
Strand Co., N. A., 3001 N. Wolcott St., Chgo.
White Dental Mfg. Co., 10 E. 40th Street,
New York, N. Y.

Shafts, Hangers & Boxes

Delta Mfg. Co., Milwaukee, Wis.

Shafts, Steel

American Hollow Boring Co., Erie, Pa.

Shapers

Western Mch. Tool Wks., Holland, Mich.

Shaping Machines

Gobron & Sexton Machy. Co., Columbus, O.
Eversen & Son, Inc., 10th & E. 2nd St.,
Chicago, Ill.

Western Mch. Tool Wks., Holland, Mich.

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Marshalltown Mfg. Co., Marshalltown, Ia.

Shears, Hand

Armstrong-Blum Mfg. Co., 5741 Blooming-

Hale Ave., Chicago

Beverly Throatless Shear Co., 2007 W.

110th Place, Chicago, Ill.

Lewthwaite Machine Co., T.H. S. M., 47th

St., New York

The National Machine Tool Co., Racine, Wis.

Whitney Metal Tool Co., Rockford, Ill.

Shears, Power

Buffalo Forge Co., Buffalo, N. Y.

Davis & Krump Mfg. Co., 7440 Leomin-

ster Blvd., Chicago, Ill.

Libert Machine Co., Green Bay, Wis.

Shears, Slitting

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Buffalo Forge Co., Buffalo, N. Y.

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ster Blvd., Chicago, Ill.

National Machine Tool Co., Racine, Wis.

Shears, Splitting

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Shears, Throatless

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Marshalltown Mfg. Co., Marshalltown, Ia.

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Monroe St., Chicago, Ill.

Vinco Mfg. Co., Buffalo, N. Y.

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Chicago, Ill.

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Penna.

Sine Tables

Gibbons Engineering Co., Detroit, Mich.

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Abert Gear & Mch. Co., 4882 W. 18th St.,

Cleare, Ill.

Armaglo Co., Milwaukee, Wis.

Chicago Gear Works, 700 W. Jackson, Chgo.

Cullinan Wheel Co., 1359 Altefeld St., Chgo.

Janette Mfg. Co., 555 W. Monroe St., Chgo.

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Wyssenek & Staff, Inc., 842 Washington

Bvd., Chicago

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Sutton Tool Co., Detroit, Mich.

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St., Cleare P. O., Chicago, Ill.

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St., Cleare P. O., Chicago, Ill.

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Marshalltown Mfg. Co., Marshalltown, Ia.

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Krauer & Hofenohl, Cincinnati, O.

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Midwest Tool & Engineering Co., Dayton, O.

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Scully-Jones & Co., 1905 S. Rockwell, Chicago

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Western Mfg. Tool Whs., Holland, Mich.

Tapping Jigs, Universal

Henderson & Kaye, Batavia, Ill.
Hauser Mfg. Co., 1638 N. Paulina St., Chgo.

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Cleerman Mfg. Tool Co., Green Bay, Wis.
Etco Tool Co., 594 Johnson Av., Brooklyn,
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Presto Safety Chuck Co., 14 S. Clinton
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Whitney Metal Tool Co., Rockford, Ill.

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Kroeger & Hudspeth, Cincinnati, O.

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James & Lamson Mch. Co., Springfield, Vt.
Ricker-Shaffer Co., Erie, Pa.

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Bridge Tool Co., Mayfield, Ohio
Rivett Lathe & Grinder Co., Brighton, Boston

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Tools

Vinco Tool Co., Detroit, Mich.
Wrought Washer Mfg. Co., Milwaukee, Wis.

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Tools, Boring

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Gairing Tool Co., Detroit, Mich.

Tools, Lathe and Planer

Armstrong Bros. Tool Co., 308 N. Francisco
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Jones Machine Tool Co., Cincinnati, Ohio

Tools, Machinists'

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Brown & Sharpe Mfg. Co., Providence, R. I.

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American Tool Works, Inc., Hartford, Conn.
Apex Machine Co., Dayton, O.

Chicago Gear Works, 709 W. Jackson Blvd.,
Chicago

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Bradford Machine Tool Co., Cincinnati, O.

Brand Mch. Sales, Pittsburgh, Pa.

Brown Machinery Co., St. Louis, Mo.

Brownell Machinery Co., Providence, R. I.

Burns Mch. Co., F. W., Milwaukee, Wis.

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Cincinnati Mch. & Supp'g Co., Cincinnati, O.

Cleveland Planer Co., Cleveland, O.

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David Machinery Co., Toledo, O.

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Eastern Machinery Co., Cincinnati, O.

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Fuchs Mch. & Supply Co., Omaha, Neb.

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Globe Mch. Co., 602 W. Lake St., Chicago

Goldman, Harvey H., Detroit, Mich.

Hill, Clark & Co., 645 W. Washington Blvd.,
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Howarth Mch. Co., Inc., C. C., Detroit

Hyman & Sons, Joseph, Philadelphia, Pa.

Indianapolis Machinery & Supply Company,
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Industrial Mch. Co., Indianapolis, Ind.

Inland Mch. Co., 40 S. Clinton St., Chgo.

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Lang Machinery Co., Pittsburgh, Pa.

Larus, J. L., Bridgeport, Conn.

McDonald Machinery Co., St. Louis

Machinery Dealers, Inc., N. w. Haven, Conn.

Marr-Galbreath Mch. Co., Pittsburgh, Pa.

Midwest Equipment Co., 625 W. Lake St.,
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Miles Machinery Co., Saginaw, Mich.

Moller Machinery Co., Charles L., 120 S.
Clinton St., Chicago, Ill.

Merry & Co., 45 Mill St., Astoria, Long
Island, N. Y.

Norton-Broadway Machinery Co., Cincinnati,
Ohio

Nottingham State Mch. Corp., New Haven,
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O'Brien Machinery Co., Philadelphia

Ohio Mch. & Supply Co., Cincinnati, Ohio

Ott Machinery Sales Co., Detroit, Mich.

Osborne & Sexton Mch. Co., Columbus, O.

Partridge, Arthur S., St. Louis, Mo.

Passman Brothers, 705 W. Washington St.,
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Prutton Mch. Co., D. H., Cleveland, Ohio

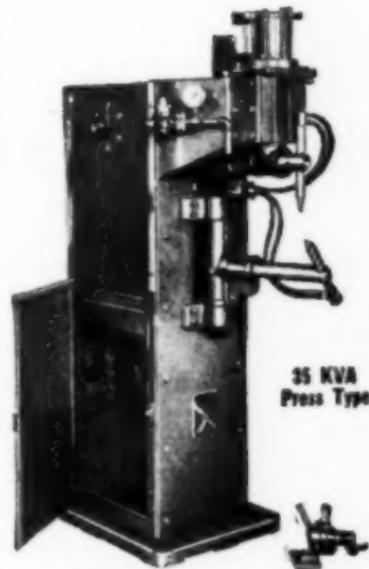
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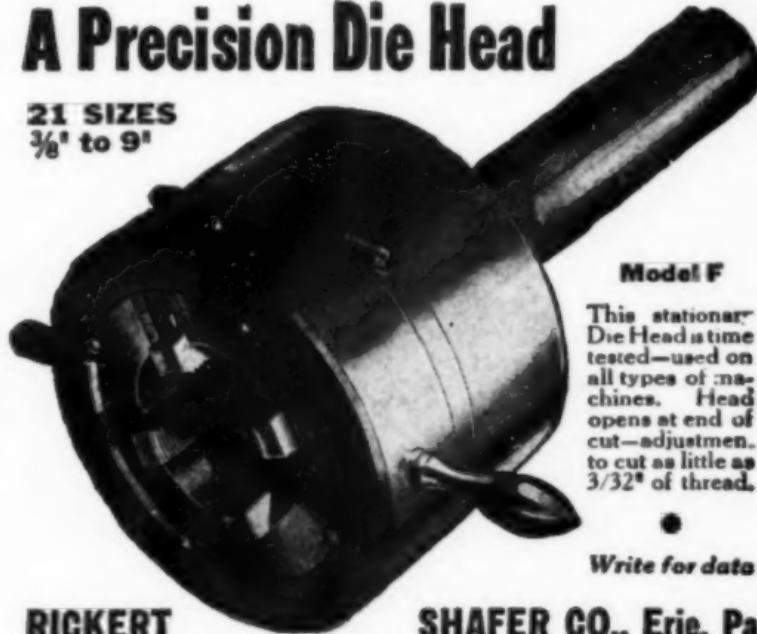
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 Surplus Stock & Mfg. Co., Inc., 618 W. Lake St., Chicago, Ill.
 Toledo Machinery Exchange, Toledo, O.
 United Mfg. & Supply Co., St. Louis, Mo.
 Victor Machinery Co., 180 S. Clinton Street,
 Chicago, Ill.
 Victor Machinery Exchange 251 Centre St.,
 New York, N. Y.
 Vines, R. A., Detroit, Mich.
 Wahl Mfg. Sales, Chas. E., Detroit, Mich.
 Warner Elevator Mfg. Co., Cincinnati, O.
 Wertman Machinery Co., Cleveland, Ohio
 West Penn Machinery Co., Pittsburgh, Pa.
 White Mfg. Co., A. D., 109 N. Jefferson
 St., Chicago
 Wiggleworth Machinery, T. R., Cleveland, O.
 Wiggleworth Mfg. Co., Cambridge, Mass.
 Wolnick Mfg. Sales, 9 S. Clinton, Chicago

Vacuum Cleaners, Portable

Breuer Elect. Co., 846 Blackhawk St., Chgo.
 Vacuum Cleaners, Industrial

Breuer Elect. Co., 846 Blackhawk St., Chgo.

Valves, Air

Hanna Engineering Works, 1763 Elston
 A. S., Chicago, Ill.
 Ross Operating Valve Co., Detroit, Mich.

Valves

Galland-Henning Mfg. Co., Milwaukee, Wis.
 Hanna Engineering Works, 1763 Elston
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Valves, Foot, Lever & Solenoid

Hanna Engineering Works, 1763 Elston
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 Nicholson & Co., W. H. Wilkes-Barre, Pa.
 Ross Operating Valve Co., Detroit, Mich.

Valves, Operating

Hanna Engg.-series Works, 1763 Elston
 Chicago, Ill.
 Ross Operating Valve Co., Detroit, Mich.
 Tomkin-Johnson Co., Jackson, Mich.

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Modern Machine Tool Co., Jackson, Mich.

Vises, Drilling Machine

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 Armstrong Bros. Tool Co., 305 N. Francisco Av., Chicago

Desmond Stephan Mfg. Co., Urbana, O.
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 Heuse Mfg. Co., 163 N. Pauline St., Chgo.
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 Modern Machine Tool Co., Jackson, Mich.
 National Machine Tool Co., Racine, Wis.

Odin Universal Corp., 110 S. Dearborn, Chgo.
 Walker-Turner Co., Inc., Plainfield, N. J.
 Yost Mfg. Co., Meadville, Penna.

Vises, Drill

Johnson Tool Co., East Providence, R. I.
 Modern Machine Tool Co., Jackson, Mich.
 Plunket Mfg. Co., 1823 W. Lake St., Chgo.

Vises, Machinist's

Desmond Stephan Mfg. Co., Urbana, Ohio
 Knu-Vise Products Co., Detroit, Mich.

L. W. Chuck Co., Toledo, Ohio
 Odin Universal Corp., 110 S. Dearborn, Chgo.
 Western Tool & Mfg. Co., Springfield, O.
 Yost Mfg. Co., Meadville, Penna.

Vises, Milling Machine

Graham Manufacturing Co., Providence, R. I.
 Hartford Special Mfg. Co., Hartford, Conn.
 Knu-Vise Products Co., Detroit, Mich.
 L. W. Chuck Co., Toledo, Ohio
 Odin Universal Corp., 110 S. Dearborn, Chgo.
 Plunket Mfg. Co., 1823 W. Lake St., Chgo.
 Yost Mfg. Co., Meadville, Penna.

Vises, Precision

Odin Universal Corp., 110 S. Dearborn, Chgo.

Vises, Shaper

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 L. W. Chuck Co., Toledo, Ohio
 Odin Universal Corp., 110 S. Dearborn, Chgo.
 Plunket Mfg. Co., 1823 W. Lake St., Chgo.

Vises, Special

Modern Machine Tool Co., Jackson, Mich.

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Hobart Brothers, Troy, Ohio

Lincoln Electric Co., Cleveland, Ohio

Welders, Portable

Hobart brothers, Troy, Ohio

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Welding Goggles

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Welding Lens, Arc

The Lincoln Electric Co., Cleveland, O.

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 Kaiser Engineering Co., Inc., Newark, N. J.
 Hobart Brothers, Troy, Ohio
 Interstate Machinery Co., Chicago, Ill.
 Pier Equipment Mfg. Co., Benton Harbor,

Welding Machines and Equipment, E. I. Arc

The Lincoln Electric Co., Cleveland, O.

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 Kaiser Engine Ring Co., Inc., Newark, N. J.
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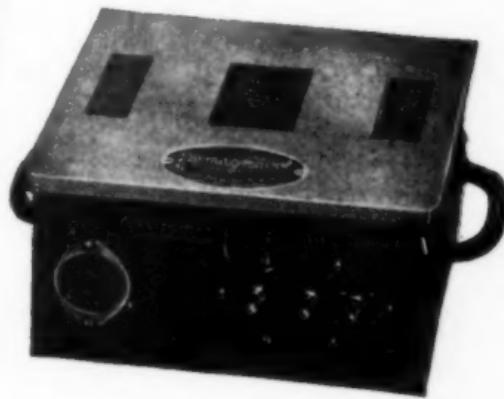
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Threader, Bliss No. 119 screw cap (arr. m. d.)
Threader, Bliss No. 156 auto. thread rolling (m. d.)
Threader, Bliss No. 153 C, (m. d.)

USED AND REBUILT MACHINERY

FOR SALE BY

Scott-Bansbach Machinery Co., 4607 West 20th St., Chicago, Ill.

Automatic screw machines, B. & S., Nos. 00, 0, 2	\$450 to 1250.
Automatic screw machine, B. & S. No. 19 high speed, cap. $\frac{3}{4}'' \times 1\frac{1}{2}''$, b. d.	400.
Automatic screw machine, B. & S. No. 19 high speed, with motor.	500.
Automatic screw machine, Cone, 1", 4 spdl., b. d.	1250.
Automatic screw machine, Davenport, $\frac{3}{4}''$, 5 spindle, b. d.	750.
Automatic screw machine, Gridley 4 spdl. Model F, 24"	1000.
Automatic screw machine, Gridley, 4 spdl., $\frac{3}{4}''$ Model G. and F.	600.
Automatic screw mchne., Cleveland, $\frac{3}{4}''$ to $\frac{1}{2}''$, model A and B.	\$250 to 450.
Automatic screw machine, Cleveland model "B", 2" cap., belt drive.	300.
Automatic screw machine, Cleveland $\frac{3}{4}''$ Model A belt drive, 13964.	3800.
Air compressor, Curtis, 8" x 8", capacity 80 to 110 cu. ft.	275.
Air compressor, Chicago Pneumatic, 10" x 8", capacity 117 cu. ft.	250.
Buffer, 5 H. P. Hill Curtis, rite speed, tex rope drive	300.
Broach, Hercules Power, 15 ton, motor drive.	400.
Drill, New Albany, h. s., motor drive, 110-60-1.	100.
Drill, Leland Gifford, h. s., b.b. sensitive, $\frac{3}{4}''$ capacity.	75.
Drill, Demco h. s., b. b., $\frac{3}{4}''$ capacity	110.
Drill, Allen, 14" H. S. - B. B. No. 2. M. T.	175.
Drill, 2 spindle Leland-Gifford h. s., b. b., sensitive, $\frac{3}{4}''$ cap.	150.
Drill, 2 spindle Leland-Gifford h. s., b. b., 14", No. 2 M. T.	250.
Drill, 2 spindle, Kern, h. s., b. b., 16", No. 2 tapping attachment	250.
Drill, 3 spindle Avey, h. s., b. b., bench type on pedestal, $\frac{3}{4}''$ cap.	200.
Drill, 3 spdl., Leland-G., 24" swing, h. s., b. b., 12" travel, 26" x 54"tbl.	500.
Drill, 4 spindle, Dwight-Slate, H. S., B. B., 16" swing No. 2 M. T.	325.
Drill, 4 spindle Demco h. s., b. b., 16" swing, $\frac{3}{4}''$ capacity	400.
Drill, 6 spindle, Avey, No. 4, H.S.B.B., belt drive	600.
Drill, 20" Canedy-Otto, back geared, power feed	100.
Drill, gang, 3 spindle Barnes, 22" swing b. g., p. f., No. 4, m. t.	275.
Drill, 21" Kokomo, hi speed, sliding head, back geared power feed.	275.
Drill, 24" Cincinnati-Bickford sliding head, back geared, power feed.	300.
Drill, 32" Mechanics, sliding head, back geared, power feed	350.
Gasoline engine, 10 h. p. Gray, automatic start.	125.
Grinder, gear cutter, No. 23 Brown & Sharpe, 8" capacity	300.
Gear cutter, B. & S. No. 3, 26" for spur gears	300.
Gear hobber, No. 00 Fauster, cap. 8" x 6" x 10 DP	100.
Grinder, 6" x 32" Norton plain motor drive with motor.	1000.
Grindor, 8" x 20" Fitchburg, takes 17" automatic feeds, b. d.	400.
Grinder, surface, No. 2 B. & S. with mag. chuck, cap. 18" x 6" x 8"	550.
Grinder, surface, No. 2 Diamond, cap. 10" x 24", magnetic chuck, b. d.	600.
Grinder, Safety, surface, capacity 16" wide, 50" long, 12" high, belt dr.	500.
Grinder, Heald, No. 65, cylinder, 16" spindle and fixture.	350.
Hammer, No. 1 $\frac{1}{2}$ B, High Speed, motor shelf, $\frac{3}{4}''$ capacity	100.
Hammer, No. 1 $\frac{1}{2}$ B, High Speed motor shelf, $\frac{3}{4}''$ capacity 12" gap	125.
Hammer, No. 3 A h. d., $\frac{3}{4}''$ cap, with motor	200.
Hammer, No. 4 A, High Speed belt drive, $\frac{3}{4}''$ cap	200.
Hammer, No. 3 A High Speed, motor shelf, $\frac{3}{4}''$ capacity	275.
Hammer, Bradley, 30 lb. compact belt drive	200.
Hammer, Bradley, 40 lb. rubber cushioned helve, belt drive	325.
Hammer, Bradley, 50 lb., upright strap, belt drive	400.
Hammer, Bradley, 60 lb., rubber cushioned strap, belt drive	500.
Lathe, Stark bench, 7" x 30" x $\frac{3}{4}''$ cap., c. r., s. r., c. s. and chuck	150.
Lathe, 11" x 5", C. A. Mann, 3 jaw chuck, experimental use	150.
Lathe, 13" x 5" Monarch q. c., s. b. g., 4 jaw chuck taper att. rebuilt	300.
Lathe, 13" x 5" Willard, semi q. c., d. b. g.	200.
Lathe, 13" x 5" South Bend, standard change gears	200.
Lathe, 14" x 6" Worcester semi q. c., with 4 jaw chuck	175.
Lathe, 14" x 6" LeBlond, q. c., D. B. G. 4 jaw chuck, 16" swing	350.
Lathe, 15" x 5" South Bend, standard change gears	250.
Lathe, 15" x 6" Springfield, q. c., b. g., taper attachment	350.
Lathe, 18" x 8" Davis d. b. g., q. c., heavy duty	450.
Lathe, 20" x 8" Walcott, q. c., d. b. g.	550.
Lathe, 20" x 8" Prentice, plain change with 2 chucks	150.
Lathe, 21" x 8", LeBlond, q. c., 4 jaw chuck	350.

USED AND REBUILT MACHINERY

Scott-Bansbach Machinery Co.—Continued

Lathe, 24"x13' Dietz, Schumacher & Boye, plain change, with chuck.	300.
Lathe, 30"x13' H. S. & G. heavy duty, q. c., d. b. g. 16,000 lbs.	1000.
Lathe, 50"x24' Fitchburg, triple geared, pl. change, blocks to 64° & 76°	1500.
Lathe, 18"x5' spinning, Grabo, 24" between centers.	175.
Lathe, 22"x44" spinning gap, Prybil, 40"-76" between centers.	350.

FOR SALE BY

D. H. Prutton Mch. Co., 5295 W. 130th St., Cleveland, Ohio

Automatic, Cleveland 1" model A.
Automatic, Cleveland 21" model A.
Chucker, 1" Cleveland model M
automatic.
Drills, 1" cap. Demco 4 spindle,
power feed, b. b. (3)
Gear hobbers, No. 0 and No. 1.

Schuchardt & Schutte.
Grinder, disc, No. 120 Gardner.
Tappers, (5) Webster & Perks 5
spindle vertical.
Press, No. 106 Bliss.
Press, cam drawing, No. 1 Bliss.
Presses, No. 4 & 5 Zeh & H. incl.

FOR SALE BY

Lang Machinery Company, 28th St. & A. V. R. R. Pittsburgh, Pa.

Air compr., 12"x10' Chgo. "nab" m.d.
Aircom. Bury class" b" 810 c.f.m.d.
Automatics (4) No. 8-A Potter & J.
Automatic, 24" cone 4 spdl. m. d.
Blower, No. 5 Sturtevant, 8½" dis.b.d.
Bor. mill, 30" Bullard, third.att., spd.
Bor. mill, 76" Bullard, 2 Hds. m. d.
Bor. mill, 84" Sellers, 2 hds. b. d.
Boring mill, 6" bar N. B. P. dbl. post.
Bolt cutter, 1" Landis, sgl. hd., b. d.
Bolt cutter, 1½" Acme, sgl. hd., b. d.
Bolt cutter, 1½" Acme, b. d.
Brake, leaf, No. 205 10'x3/16"D&K
Broach, No. 3 LaPointe, m. d.
Buffer & pol. 5 H. P. AC Marschke.
Die sinkers, Nos. E 3, E 4, Keller.
Drill, No. 1 24" Baker, cap. 2½".
Drill, rad. 2' Fosdick, t. a., b. d.
Drills, rad. 6' American, m. d.
Drill, rad. 6' Bickford m. d.
Drills, upright, 14" to 32".
Drill, sens. No. 1 Avey, b. b., b. d.
Drill, sens. 3 sp. Reed, b. d.
Drill, 4 sp. No. 2 Foote-Burt, m. d.
Drill, 16-spdl. No. 12 Pratt & W.
Gear millers, No. 1 Bilton, b.d. (2).
Gear miller, Standard, 4½"x4½", b.d.
Grinders, single and double end.
Grinder, disc, dbl. 18" Diamond, b.d.
Grinder, flex. shaft 4 H. P. Mall.
Grinder, surf. 14" Pratt & W. b. b.
Grinder, t & c., No. 1 W. & M. b.d.
Grinder, univ. No. 1 B & S. m. d.
Hammer, 100lb. Bradley, cushioned.
Hammer, forg. 5000-lb. Niles-B-P.
Hammers, st drop 2000-6000 lb. Eric.
Keyseater, No. 4 Mitts & M. b. d.
Keyseater, No. 2 Baker, m. d.
Lathe, 14"x6" Carroll, q. c. g., b. d.
Lathe, 14"x8" Hendey Tie B. t.a.b.d.
Lathe, 16"x6" American, q.c.g., b. d.

Lathe, 20"x16' Shum. B&E t.a., b.d.
Lathe, 24"x10' Bradford, p.c. g., b.d.
Lathe, 26"x12' Bridgeford, q.c.g., b.d.
Lathe, 30"x14' L. & S. q. c. g., m.d.
Lathes, tur. No. 4 W. & S. b. d.
Miller, plain, No. 2 Cincinnati b. d.
Miller, plain, No. 2½ Le Blond, b.d.
Miller, plain No. 28 Ohio, b. d.
Miller, plain No. 4 Le Blond.
Miller, plain b. & s. tbi. 17"x72".
Miller, univ. No. 1 Cincinnati b. d.
Miller, univ. No. 2-B Hendey, b. d.
Miller, 26"x26"x12' Ing. adj r.
Millers, vert. Nos. 4-L & 6 Becker.
Planer, 36"x36"x10' Cin. 2 hds.
Planer, 42"x42"x10' Cincinnati, m.d.
Planer, 60"x48"x14' N - B. P. 3hds.b'd
Planer, 72"x56"x20' Cin. 3 hds. m.d.
Press, No. 1-C standard, pedestal.
Press, No. 0 Stiles, 1" stroke.
Press, cam, 400 ton Perkins, str. 20".
Press, o. b. i. No. 20 Bliss, 2" str.
Rolls, bending, 8"x10 ga. 5" dia. rolls.
Saw, hack, 13"x16" Peerless, m. d.
Shaper, 28" Queen City, b. g., b. d.
Shaper, 25" Smith & Mills, b. d.
Shaper, 24" Cincinnati, b. g., b. d.
Shaper, 16" Amer. d. b. g., b. d.
Shaper, 16" Rockford, b. g., b. d.
Shear, rot. No. 5-A & 6-A Quickwork.
Shear, sq. 10"x3/16" Geo. A. Ohl. b.d.
Shear, sq. 10"x3/16" Niagara, m. d.
Shear, sq. 13"x4" Hyde Park, 18" gap.
Shear, open end, No. 3 United, m. d.
Straighteners, Shuster 6' & 12' x 4'.
Tapping machine, 10" Baker, s.p.d.
Testing mach., 200,000 lb Olsen, m.d.
Wiring & edging mch. No. 2 Magee.
Welders, arc, 200-300 amp. Lincoln.
Unishear, No. 0 36"x16 ga., m. d.

USED AND REBUILT MACHINERY

FOR SALE BY

Joseph Hyman & Sons, - Tioga & Almond Sts., Philadelphia, Pa.

POWER PRESS SPECIALISTS

407A Bliss toggle, tie rod.

600 ton No. 25K Bliss embossing KJ

500 ton American Can embossing KJ

168 Toledo, toggle.

No. 79A Bliss, 16" stroke tie rod.

10'x $\frac{1}{2}$ ' shear gap, 15" Wais & Roos.

Shuster straight 8"x14' & 8"x15'.

Hundreds of presses of various types.

FOR SALE BY

M. A. Wertman Machinery Co., 623 Penton Bldg., Cleveland, Ohio

Automatic, 2-2 $\frac{1}{2}$ " B Cleveland, m. d.

Drill, Barnes 20" camelback.

Drill, Rockford 26" sliding head.

Drill, radial, 3 $\frac{1}{2}$ ' Mueller.

Drill, radial, 3' American.

Gear cutter, No. 4-36" B. & S.

Grinders, B. & S. No. 2surf. rebuilt.

Grinder, Norton 6x32" (2).

Grinders, Norton 10"x50".

Lathe, precision bench, P. & W.

Miller, B&S No. 2 plain cone type.

Miller, Superior hand, A 1 cond.

Nibbler, Campbell No. 2, 24" thrt. md.

Swager, No. 3 & No. 4 Langelier.

FOR SALE BY

Reliance Machinery Sales Company

1405 Brighton Place, N. S.

Pittsburgh, Pa.

Air compres., 90 and 342 cu. ft. Ing.

Brake, 10'x10 g.a. Ohl, press type.

Brake, press, 72" Rob. toggle m. d.

Brake and folder, 72" Niagara,

22 gauge, motor 3-60-220.

Bulldozer, No. 9 W.-W., 70,000 lbs.

Drill, 4 spindle Colburn, Mfg. type, cap. 2", like new.

Drill, 25" Prentiss, tapping att.

Hammer, 80 lb. Brad. cushion helve.

Hoists, chain, 1 $\frac{1}{2}$ and 2 ton Y & T.

Lathe, 20"x10' Bradford taper.

Lathe, 20"x12' 6" Am., cone, taper.

Lathes, spinning, 30" Bliss & Tol., roller bearing.

Miller, No. 4 Cin., plain, cone.

Nibbler, No. 1 Gray 34" tht., 3/16" capacity, m. d.

Press, Robinson dbl. cr., 80" wide, 4" shaft, grd. 3" stroke.

Riveter, Townsend, cap. 5/16", 31" tht.

Shapers, 16", 20", 24", 25", crk.

Shear, double angle, 6x6x3/4" Clev., mounted on turnable, m. d.

Welders, 300 and 400 amp. Lincoln, motor end 3-60-220-v.

FOR SALE BY

International Machinery Co., 3178 Bellevue Ave., Detroit, Mich.

DRILLS

21", 24" & 36" Cincinnati t. a.

263 Camel Back Barnes.

1, 2, 3, & 4 spindle Leland & Gifford.

No. 70 Heald internal, self-contained.

Nos. 1, 2 & 3 Brown & S. universal belt & m. d.

Avey and Edlund, hand and power feed.

3' American radial, gear box.

GRINDERS

No. 22 & 25 Heald Rotary.

No. 11 Brown & Sharpe plain, s.p.d. Cincinnati face mill, m. d.

LATHES

16x8 Monarch geared head, motor in base.

MILLS

No. 3 Van Norman s. p. d.

18" & 24" Cinc. dup. widened pattern.

6"x24" & 6"x60" H. & W. thread.

16" and 24" G. & E., m. d.

TURRET LATHES

No. 4 Warner & Swasey universal geared head, m. d.

No. 6 Warner & Swasey univ. m. d.

No. 4 Brown & Sharpe, hand.

AUTOMATICS

9/16 Model G Gridley motor drive.

USED AND REBUILT MACHINERY

FOR SALE BY

West Penn Machinery Company

1210 House Building,

Air compressors, 20 to 2500 cu. ft.
 Blower, No. 4 Roots, cap. 2110 c.f.m.
 Bolt cutter, Acme 2", belt drive.
 Bolt cutter, National 1" cap., b. d.
 Bor. mills, 24" Bullard New Era.
 Boring mill, 42" King, b. d.
 Boring mill, 60" Colburn, 3 hds., spd.
 Boring mill, 62" Betts, 2 heads, b. d.
 Boring mill, 10"-16" Betts, m. d.
 Boring mill Hor. 3" universal m.d.
 Bor. mill, hor. 5" bar Barrett, m. d.
 Brake, 7"x10 ga. D. & K. m. d.
 Bulldozers, Nos. 2, 4, 6, 9, 28, & 30.
 Crane, 5-ton Case, 65' span, 220-d.c.
 Crane, 7½-ton Morgan, 220-d. c.
 Crane, crawler, gas., No. 2 No. wes.
 Draw bench 20000 lb. W.F.
 Drill, radial, 4" Prentice, t. a. b. d.
 Drill, rad. 5" Cincinnati-Bick., m. d.
 Drill, radial, 5" American, s. p. d.
 Drill, rad. 6" Reed-Prentice, s. p. d.
 Drill, mult. 24 sp. No. 30 Natco.
 Drills, upright 10" to 36".
 Drill, press, 6 spindle Allen.
 Engine, gas, 20 h. p. Bessemer.
 Flanger, McCabe, 1" capacity, dies.
 Gear cutters, 11", 18" & 24" Gleason.
 Gear tester, bevel 18" Gleason.
 Grinder, No. 55 Heald, b. d.
 Grinder, roll, Farrel 28"x64".
 Grinder, d. e. 2 h. p. 220/440/3/60.
 Grinder, D.E., 3HP, 220/3/60.
 Grinder, disc, No. 8-20" Besly, b. d.
 Grinder, disc, No. 4 Gardner, m. d.
 Grinder, 12x42" Landis univ. v.
 Grinder, surface 8" Heald.
 Grinder, sur. 14" Pratt & W., m. d.
 Grinder, surf. Diamond, table 48x16".
 Grinder, int. No. 60 Heald, b. d.
 Grinder rotary, 12" Heald, s. p. d.
 Hammer, power, 50-lb. Blacker.
 Hammer, power, 90-lb. Justice, b. d.
 Hammer, pwr. 100 lb. Brad. cush.
 Hammer, Brad. 500 lb. upright.
 Hammers, Nos. 2-B, 3-B, 4-B, Nazel.
 Hammers, steam, forging & drop.
 Keyseater, No. 2 M & M, b. d.
 Lathe, 11"x5" Meyers, p. c. g., b. d.
 Lathe, 18x8", S-L b. d.
 Lathe, 18"x8", L. & S., b. d.
 Lathe, 20"x10", Draper, b. d.
 Lathe, 22"x12" R-L q c.g., d. b. g.
 Lathe, 24"x15" Prentice, grd. hd.
 Lathe, 42"x16" S. B., q.c.g., b. d.
 Lathe, roll, 18"x14".
 Lathe, spinning 32" b. d.
 Lathes, turret, No. 4 W & S. b. d.
 Lathe, turret, No. 6 W & S. grd. hd.
 Lathes, No. 2 W. & S. turret, b. d.
 Lathe, turret, No. 2A, W. & S., m.d.
 Miller, vert. No. 6 Becker, m. d.
 Miller, 4-B B & S plain, m. d.
 Motors, a. c. & d. c.

Pittsburgh, Pa.

Nibbler, No. 1 Gray 3/16", 34" thrt. bd
 Nut tapper 8 sp. 1" National.
 Pickler, 4 arm Mesta, 10' radius.
 Pipe machine, 2" Landis, b. d.
 Pipe mach, 2", 6", 8", 12" Williams, md.
 Planer, 36x36x10' Cincin. b. d.
 Planer, 42x42"x12' Cinc., 3 hds., b.d.
 Press, No. 20B Bliss, OBI.
 Press, No. 5 L. & J. OBI.
 Press, No. 3 Bliss, Stiles type.
 Press, cam, No. 68N Bliss, dbl act, inc.
 Press, horn., No. 43 Toledo 1½" str.
 Press, No. 93-B Toledo, b. d.
 Press, hyd. 100-ton Southwark.
 Press, hyd. 200-ton Oilgear.
 Press, No. 55 Toledo, bed 20x19.
 Press, sgl. crank, No. 77½ Bliss, bd.
 Press, No. 78½ Bliss, str. 10" tie rod.
 Press, dbl. crank No. 5 Bliss, 2" str.
 Press, gap, No. 74 Bliss consolidated
 Press, screw, No. 87 Niagara.
 Press, wheel, hyd. 300 ton Niles.
 Press, 6 spindle, W-F.
 Punch, Rock River, 1" to 3".
 Punch, EF Cleveland, 36" thrt., 1½"-1"
 Pumps, Cent. 6", 4", 1", m. d.
 Riveters, air, hammer, spinning.
 Rolls, angle, Nia. 1½x1½x1".
 Rolling mill, cold 9"x18".
 Saws, friction, Nos. 2, 3 & 4 Ryerson.
 Saw, cold, 48" Newton.
 Saw, hack, Peerless, 4½x14".
 Saw, hack, Racine 6x6".
 Saw, hack, Peerless, 13"x16", m. d.
 Scale, sheet bundling, 2500 lbs.
 Shapers, 16", 20", 24" & 36" G. & E.
 Shears, alligator, 1½", 2", 3", 4" & 6".
 Shear, angle 6x6x1", Cleveland.
 Shear, circle, Niagara, 4" cutters.
 Shear, circle No. 3 Bliss, 40"x20 ga.
 Shear, bar 1½", New Doty.
 Shear, bevel, Lennox 1", b. d.
 Shear, plate, No. 6 H & J. 10"x3".
 Shear, throatless, 1" Lennox b. d.
 Shear, sq., No. 662 Nia.; 62"x10ga., bmd
 Shear, sq., No. 48 Exc. 14ga. bls 53".
 Shear, sq. 11"x10 ga. Niagara, m. d.
 Shear, plate, 80"x4" Pels.
 Shear, 24x8" Bliss, b. d.
 Shear, rotary 24" thrt. cap. 1", m.d.
 Shear, Buffalo all steel 3" sq., m. d.
 Slotters, 6" Newton, 8" & 21" Beuts.
 Slotter, 24" Newton, motor drive.
 Straightener, AS&TP 12"x3/16", bd.
 Straightener, 42" Aetna std 17' roll 34".
 Straight'r, 48" Aetna-Std 17' roll 34".
 Straightener, Shuster, 12"x4".
 Straightener, 19", 4" rd. Abramson.
 Straightener, No. 5 K. & R., b. d.
 Tumbling barrel, 34"x45", b. d.
 Upsetters, 1" to 8".
 Welder, 40 kw. Thom. 2 pcs. 1".
 Welder, butt 1½" Winfield.

USED AND REBUILT MACHINERY

FOR SALE BY

Wiggleworth Machinery Company

199 Bent Street,

Cambridge, Mass.

Boring mill, No. 21 Lucas horizontal.
Boring mill, 24" bar Cleveland.
Grinder, No. 14 P. & W. model B.

Lathe, 20" x 12' Monarch, grd. hd.
Saw, Avey Milband, 6" x 6" m. d.

Send for Complete Stock List.

FOR SALE BY

J. Bleser Mfg. & Machy. Co., 16th & Madison St., Springfield, Ill.

Drill, 24" Amer. s.h. b.g. p.f. \$125.
Drill, 34" Barnes s.h. b.g. p.f... 195.
Grinders, No. 1 1/2 & 2 Landis ... 175.
Lathe, screw cut, 14" x 5' 75.
Miller, No. 2 Cincinnati..... 450.

Miller, No. 3 Burke type, p. f. \$125.
Miller, No. 6 Transit, hvy. duty 400.
Pipe thread. mch. 2 1/2" to 8".... 145.
Planer, for wood 26" Fay 45.
Radial, drill, 7'..... 295.

FOR SALE BY

E. L. Klauber Machinery Co., 320-322 South Third St., St. Louis

Drills, No. 00 bench precision.
Gauges, dial thickness, pedestl. \$10 ea.
Grinder, No. 3 Bath, universal with
all attachments.
Lathes, Nos. 0, 1, 2, 3 & 4 Precision.
Lathe, 24"x12' wood turn, iron bed.

Miller, No. 00 vertical bench.
Millers, No. 1 Knight vertical.
Miller, 16"x55" Newton horizontal.
Press, straight side, 56 tons.
Saws, 4x4; 6x6 Racine H. S.
Shapers, 16"-18"-20" Ohio, American.

FOR SALE BY

Fuchs Machinery & Supply Co.,

Drill, 9" Sipp.
Drill, 3 1/2" Bickford radial.
Drill, 25" sliding head.
Drill, 42" Barnes sliding head.
Grinder, 6x72 Norton.
Grinder, 10x24 Landis piston.
Grinder, 10x26 Norton.
Grinder, Gisholt internal.
Grinder, Norton tool and cutter.
Hammer, 100 lb. Little Giant.
Hacksaw, 6x6 Peerless.
Lathe, 8 Woods tilted turret.

1102 Farnam, Omaha, Nebr.
Lathe, 14"x8' Rockford, q. c.
Lathe, 14"x10' Sidney q. c., t. a.
Lathe, 16"x8" Monarch q. c.
Lathe, 24"x12' Blaisdel.
Lathe, 24"x10' Monarch q. c.
Lathe, 28"x21' Pond.
Press, 125 ton hyd. wheel.
Press, D. A. C. 54 Ferracut.
Miller, No. 2 B. & S. plain.
Miller, No. 4 Hendey s. p. d.
Welders, 150, 200, 300 amp.
Lincoln—USL, Westinghouse.

FOR SALE BY

Failey-Strafer Machinery Co.,

Conveyor and chain, 360', 4" links.
Drill, Amer. 3' sens. radial t. a.
Drills, Avey Nos. 1, 1 1/2, bench.
Drills, Avey No. 3, 4 spdl., pwr. fd.
Drill, No. 121, Baker, h. p. cap. 1 1/2".
Drill, Cinn., 32" s. p. gear box.
Drill, Cinn.-Bickford 4" radial.
Drill, 24" Hoeffer gang, 2 spdl.
Drill, 9" Sipp. h. s., b. b. cap. 5".
Grinder, No. 14 P. & W. surface b.b.
Lathe, 24"x24" Acme tur. chucking.
Lathe, 3"x36" J. & L. bar & chuck'g.

136 Liberty St., New York
Lathe, (2) LeBlond h. d. eng. 17"x6".
Lathe, Sloan & Chase bench type.
Magnetic separator, Dings.
Miller, Becker, duplex Lincoln type.
Miller, B. & S. No. 5 vert., rotary.
Miller, B. & S. No. 24 plain.
Miller, Cinn., No. 3 plain, s.p.d.
Miller, Garvin plain No. 14.
Saw, Higley cut-off.
Sq. shear, 30" Bliss, cap. 5/16".
Sq. shear, 8"x14 ga. Geo. Ohl., b. d.
Surface plate, 27"x40"x4" high.

USED AND REBUILT MACHINERY

FOR SALE BY

Marr-Galbreath Machinery Co.,

Air comp., 9x8" & 10x8".
 Boring mill, 42" Bullard, 1 swivel
 and 1 turret head, m. d., p. r. t.
 Boring mill, 30" Bullard VTL,
 threading attachment.
 Brake lining punch and riveting
 machine, m. d.
 Bulldozers, Nos. 24 & 25 W-W, AC.
 motors.
 Crimping & corrugating machine,
 10"x16 Ga., Keene.
 Draw benches, 50-ton, 34' cap., for
 m. d., (3).
 Drill, 24" Aurora, t. a., m. d.
 Drill, 28" Superior, b. g., power fd.
 Drill, No. II-B, Natco, 16-sp., m. d.
 Drill, radial, 3' Dreses, tapping att.
 Drill, radial, 3½" Canedy-Otto.
 Forging mch., 16" Acme.
 Grinder, No. 21 Landis 10"x30",
 plain, b. d.
 Grinder, univ. T. & C. No. 2 Woods.
 Grinder, univ. No. 3 Cin. 16"x18", m. d.
 Grinder disc, No. 3 Gardner, 20"
 wheels, m. d. 3/60/220.
 Hammer, power, 80 lb. Boss, b. d.
 Hammer, power, 50 lb. Little Giant.
 Hammer, 100 lb. Mayer, power.
 Hammer, 200lb. Beaudry, power.
 Hammer, 400lb. Bliss board drop,b.d.
 Hammer, 800lb. Erie SF steam or air.
 Hammer, Syntro Elec., 1/60/110.
 Keyseater, No. 2 Catlin, cap, 2"x15".
 Keyseater, No. 3 Mitts & M., belt.
 Lathe, 6" Hjorth bench precision
 thread, att., turret, m. d.
 Lathe, 11"x4" So. Bend, qcg, chuck.
 Lathe, 13"x8" So. Bend, q.c.g., t. a.,
 chuck.
 Lathe, 16"x12" L. & S., q. c. g., ta.
 Lathe, 18"x8" Superior, q.c.g., d.b.g.
 Lathe, 20"x10" Johnson q. c. g., t. a.,
 Lathe, 22"x12" Rahn-Larmon, q.c.g.
 Lathe, 24"x16" L. & S., q. c. g., t.a.,
 chuck.
 Lathe, 27"x16" L. & S. selective hd.,
 q. c. g., t. a., chuck.
 Lathe, turret, No. 4 W. & S., bar
 feed, m. d., g. f. h. (2).
 Miller, univ. No. 2 Cin. serial 2520-U.
 Miller, pl., No. 15 Garvin, 42x10x21".
 Miller, No. 4 Ohio, table 101".
 Pipe machine, 2" Robbins, bench,
 motor 1/60.
 Pipe machine, 12" Cox., b. d.
 Pipe machine, 18" Wieland, m. d.
 Planer, 24"x24"x6" Gray, 1 head.

55 Water St., Pittsburgh, Pa.

Planer, Gray, 56x48x10', 4 heads.
 Polishing stand, 3 H.P.U.S., 3/60/220.
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 275 lbs.
 Press, foot, 1-A Bliss-Con. 400 lbs.
 Press, OBI No. 2 Toledo, pl. 3½" str.
 Press, OBI No. 21 Bliss, 1" & 2" str.(3)
 Press, No. 78½ Bliss T. R., 10" str.
 Press, D. C., No. 95-E Toledo, tie-
 rod; d. b. g., for m. d.
 Press, P-3 Ferracute m. d. (2)
 Press, or gang punch, No. 6 Nia. 48".
 Press or shear, United ob., 3½" shaft,
 m. d. (2)
 Pump, cent. 700 GPM., 4" disc.
 Punch, triple combination Pels 16',
 m. d.
 Punch & shear, 25x24 U. Buffalo.
 Punch and shear, No. 3 L. & A.,
 3½", 14" throat.
 Punch and shear, No. 12 Badger
 combined, b. d.
 Punch, & sh. hand, No. 3B. Beloit
 5/16"x8".
 Punches, hand No. 6 Kidder.
 Riveters, Shuster, 4" & 3/16", belted.
 Riveter, No. 120 Grant, cap. 4", m. d.
 Saw, No. 10 Racine 9x9", belted.
 Saw, cold, No. 7 Espen-L, 15" belt.
 Saw, cold, No. 1 Newton, 4½" belt.
 Shaper, 14" Steptoe, sbg.
 Shaper, 15" Springfield, sbg; belt.
 Shaper, 21" Smith & Mills.
 Shaper, 24" Barker b. g. V-ram, b. d.
 Shaper, 24" G. & E motor 220-volt, d.c.
 Shaper, 24" American b. g. crk., b. d.
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 Shear, angle, 6x6½" Kling., m. d.
 Shear, Rotary 232 Bliss 14 ga.
 Shear, throatless 18-M Marshall-
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 Shear, bar 3" United, 24" blade, m. d.
 Shear, squaring, power 30"x18 ga.
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Seamer, 48" Niagara.
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1—400	G. E.	MPC	160/300
2—300	West	SK	150/300
2—200	G. E.	DMC	300/600
1—125	G. E.	DMC	150/300
1—125	West	SK-210	225/900
8—120	G. E.	DMC	300/750
2—80	Diehl	K1-40	550/1100
1—100	West	SK	475/1000
3—75	Cr. Wh.	100 H	350/900
2—60	El. Dy.	25S	450/1200
5—60	El. Dy.	25S	525/1050
2—50	West	SK-190	225/600
12—40/50	Cr. Wh.	4	175/700
1—40	West		300/900
2—35	West	SK	500/1500
12—20	G. E.	LC	650/1950
2—7½	G. E.	RF-10A	450/1800
12—7½	West	SK-80L	400/1600
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1500	G. E., ATI	440/220	180
1400	G. E., ATI	4000/2300	514
1000	West	2200	900
450	West	440/220	257
350	Cr. Wh.	2300/440	720
225	E. McH. 3Brg	2300/4150	450

SLIP RING TYPE

1500	West. CW	2200	440
850	West. CW	2200	710
500	Al. Ch.	2300/4000	500
450	West. CW	2200	875/700
400	G. E. MT-424	4150/2300	390
300	Al. Ch ANY	2200	555
300	West. CW	440/220	1800
250	G. E. MT-424Y	4000/2300	257
250	F. Morse BV	2200	1200
250	West. CW	440/220	585
225	G. E.	440/220	1800
200	West. CW	440/220	575
200	West. CW	2200/550	870

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 Grinders, No. 12 Brown & S. 350
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 Drill, 22" Superior upright.
 Drill, 24" Blaisdell upright.
 Drill, 30" Bickford upright.
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 Lathe, 18"x6" heavy pattern, positive
 grd. feed 3-step cone, sliding d.b.g.
 Lathe, 18"x6" heavy pattern, q.c.g.,
 3-step cone friction d.b.g.
 Lathe 18"x8" q. c. g., 3-step cone,
 friction d. b. g., and turret on bed.
 Lathe, 18"x8" belt feed with carriage
 turret.

Lathe, 18"x10" heavy pattern, q.c.g.,
 3-step sliding d. b. g.
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Drill, 6" Mueller radial, mtr. dr.
Drill, D2 Colburn, 3" cap.
Gear hobsers, 18" & 24" Gould & E.
Grinder, No. 103 Rivett, internal
hole cap, 1/4" to 2".
Grinder, No. 11 B & S Plain, 6"x32"
s. p. drive.
Hammer, 800 lb. Erie, steam forging.
Hammer, 1100 lb. NBP, steam forg.
Hammer, 2000 lb. Chamberburg
double frame steam.
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Lathe, 30x24 New Haven, belt.

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machine, belt drive, lot of equip.
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S. P. drive, cap. 3".
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Miller, No. 3 LeBlond plain, belt
drive, table 12"x60", quick chge.
Miller, No. 2 Kempsmith, plain,
table 10"x48", belt drive.
Miller, No. 5 Cincinnati plain, table
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Hammers vert. 40 lb. Perfect and
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S., pat. head; 16"x6" Bradford.
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Punches, sgl. end, Cleveland "C"
26" thr. $\frac{1}{4}$ in $\frac{1}{4}$; Rock River Style
L rapid action, 24" thr. $\frac{1}{4}$ in $\frac{1}{4}$.
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Badger 10" thr. $\frac{1}{4}$ in $\frac{1}{4}$.
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Saw, cold, Higley No. 14.
Screw machines, No. 2^{1/2} P. & W.;
1x15" P. & W.
Shapers, 20" Smith & Mills; 20"
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Shear, rotary bevel, $\frac{1}{4}$ " Lennox.
Shear, squaring, 10' Stark.

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Drill, Colburn, No. 2 hvy. duty 4 spdl.
Drill, Sipp 4 spdl. h. s., b. brg.
Grinder, Bath, universal, comp. att.
Lathe, 14"x8" Monarch q. c. g.
Lathe, 18"x10" Amer. qcq taper & rel.
Lathe, 28"x12" Boye & E., q.c.g., t.a.
Lathe, 36"x12" Hamilton l. c. g.

Mill, No. 2A Garvin univ. compl. c.p.
Mill, model C Becker vertical c. p.
Mill, No. 3 Kempsmith plain, c. p.
Mill, No. 4 Cinc., hi. pwr. pl., c. p.
Planer, 36"x36"x8' American, 2 hds.
Press, 30 ton Lucas vert. forcing.
Press, No. 53 Toledo SS.
Screw machine, No. 3 Foster hand.
Shaper, 20" Ohio crank, b. g.
Shaper, 24" Potter & Johnston univ.

Boring Mills — Vertical

10' Niles, 2 swivel heads.
60" Bullard, Rapid Traverse, M. D.

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—Planer Type, M. D.
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Model CS Becker, Continuous, Vert.

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66"x30' Johnson, cone dr., hvy. duty.
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28"x17' Chard, motor drive.
24"x12' Lodge & Shipley, Grd. Hd.

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72"x72"x12' Cinc., 3 Hds., M. D.

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24" G. & E. Shapers, cone drive.
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3' and 4' Morris Radial—S. P. belt drive through gear box.

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3½" bar, horiz.
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Bullard 24" vert.
N. B. P. 44" hvy. duty. P.R.T. vert.
N. B. P. 42", 44", 51", 52" vert.
Colburn 54", 2 swivel heads, vert.
Niles 7-10' Extension vert.
Pond 90", 2 heads vert.
Niles 10' vert.

AUTOMATIC SCREW MACHS.

Gridley 9 1/16", 7 1/8", 1 1/2", 1 1/2" 2 1/2".
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Gleason 24" gear planers.
Barber Colman Nos. 3, 12 hobbers.
Cleveland 8 spindle gear hobber.

DRILL PRESSES—Mult. Spd.

Natco Nos. 12, 13 and 22.
Pratt & Whitney No. 12.
Natco C-11 high speed.
Natco C-13-H hydraulic.
Baush No. 4 rect. hd. 58x42; 30 sp.

TURRET LATHES and SCREW MACHINES

Brown & Sharpe 6F Screw Mach.
Libby 26" Turret: grd. hd.; 7½" spdl.
Gisholt 24" Turret.
Warner & Swasey No. 6.

MILLING MACHINES Plain and Universal

Cincinnati No. 2, 3, 4 Plain, SPD.
B. & S. No. 2, 2B, 3, 4 Plain SPD.
Brown & Sharpe No. 2, 3A univ.
Brown & Sharpe No. IV plain;
latest type.

1000 other machines in stock—Ask for details

MOREY MACHINERY CO., Inc.
410 Broome Street.

Kearney & Trecker No. 1B plain
power rapid trav.

Kearny & Trecker No. 1½B univ.

GRINDERS

Heald No. 72 Hydraulic.
Heald No. 72-A, J sizematic.
Bryant No. 3 internal.
Blanchard Nos. 10, 16 surface.
Heald Nos. 50, 55, 60, 65 internal.
Norton 14x72, plain cyl.
Pratt & Whitney No. 14 surface.

LATHES

Niles Bement Pond 46"x15" q. c. E.
Putnam 36"x28" grd. hd. nearly new.
Pittsburgh 36"x38" grd. hd.
Bridgeford 36"x60" boring & turning.
Bridgeford 36"x60" boring.
McCabe 27-49"x16" double spindle.
Le Blond 25"x12", cone drive.
Pratt & Whitney 16"x8" all grd. hd.
Greaves Klusman 16"x8" m. in base.
Monarch 14"x10" grd. hd.

Hendey 14"x8" geared head.
Springfield 14"x6" geared head.

MILLING MACHINES

Manufacturing

Gooley & Ed. (Briggs) types A & B.
Cincinnati 18", 24" automatic.
Ingersoll No. 3 combined hvy. duty.
Ingersoll 24"x24"x12" planer type.
Ingersoll 24"x24"x12" adj. rail.

MILLING MACHINES

Vertical and Thread

Brown & Sharpe No. 1 vert.
Becker No. 4B, C-1 and C vertical.
Pratt & Whitney 4½x12, 6x16.
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standardized spidle nose.

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American 3'.
Drieses 3'.
Reed Prentice 4'.
Cincinnati Bickford 6' pl.

DRILL PRESSES—High Speed

An assortment of 1, 2, 3, 4 and 6 sp.
high speed ball bear. drill presses.
What are your requirements?

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- No. 2F Norton Lapper, m. d., latest type, like new.
Cincinnati Face Mill Grinder, m. d.
6x18⁸, 10x24⁸, 10x36⁸, 10x52⁸,
10x72⁸, 12x36⁸, 12x52⁸, 12x72⁸,
16x32⁸, 16x52⁸, 16x72⁸, 20x144⁸
Landis Plain Self-Contained Cylindrical Grinders, motor drive.
No. 11 Brown & Sharpe 6x32⁸ Plain Cylindrical.
6x32⁸, 10x36⁸, 10x50⁸, 10x72⁸, 12x72⁸,
16x36⁸ Norton Plain Cylindrical Grinders, belt and motor drive types.
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8x30⁸ Modern Plain Cylindrical, m. d.
12x36⁸ Cincinnati plain cylindrical, belt.
No. 50, 55, 60, 65 Heald Cylindrical.
No. 4 Gardner B. B. Disc.
No. 6 Diamond Disc.
No. 14 Gardner Disc.
No. 24—53⁸ Gardner Horiz. Disc, m. d.
No. 120 Gardner Disc.
No. 1 Landis Internal, belt.
No. 3 Bryant Semi-Automatic Hole, m. d.
No. 3 Rivett Internal, belt.
No. 11 Giddings & Lewis Teromatic, 3 motor drive.
No. 15A Bryant Plain Semi-Automatic 2 spindle Hole & Face, m. d.
No. 70 Heald Internal, belt.
No. 72A5 Heald Plain Internal, 2 motor drive, hydraulic, latest.
No. 103 Rivett Internal.
No. 2 Brown & Sharpe Automatic Surface, belt.
No. 3 Brown & Sharpe Planer Type Surface, belt.
No. 3 Wilmarth & Morman Automatic Surface, b-l.
No. 33 Abrasive Vertical Surface, m. d. in base.
No. 78 Wilmarth & Morman Automatic Surface, m. d. in base.
No. 210—8⁸ Heald Ring.
12⁸ Pratt & Whitney Vertical Surface.
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No. 1½ Cincinnati Tool & Cutter, belt.
No. 1 Norton Universal Tool & Cutter, belt.

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No. 3 Brown & Sharpe Universal, belt.
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RADIAL DRILLS

- 3¹ Mueller, gear box.
3¹, 4¹ Fodick, gear box.
2½, 3¹, 3½ Carlton Sensitive.
4¹ Hammond Jack Knife.
4¹ Morris Plain, gear box.
5¹ Bickford Plain, d. c. motor drive.
5¹ Cincinnati Bickford Universal, m. d.
6¹ Dreses Universal, m. d.
5¹ American Triple Geared Plain.
7¹ Fodick Plain, cone.

MULTIPLE SPINDLE DRILLS

- No. 14 Natco, m. d.
No. B16 Natco, m. d., tapper.
No. 18, 30 Natco, belt.
D2 Fox Multiple, m. d.
No. 2 Bauch Multiple, m. d.
No. 5D, 7D Moline Hole Hog.
No. 10C Natco Multiple, m. d.
No. 12 Natco Multiple, m. d.
No. 25 Baugh Multiple, m. d.
No. 26C Fox Multiple, with tapper.
No. 51C Harrington, belt.
No. 216 Baker 2 spindle Heavy Duty.
No. 220 Baker 2 spindle Heavy Duty.
2, 4, 8 spindle Allen H. S., B. B.
2, 3, 4, 6 spindle Avey H. S., B. B., No. 2 Taper.
4, 6 spindle Avey No. 3 H. S., B. B.
2 spindle Leland & Gifford, m. d. on spindles.
3 spindle Demco, power feed.
3 spindle Hoefer, 22⁸ Gang.
3 spindle Rockford 22⁸ Gang.
3 spindle Sipp.
4 spindle No. 2 Colburn Mfg.
4 spindle No. 2 Foote-Burke.
4 spindle No. 4 Foote-Burke.
4 spindle No. 2 Fodick.
2, 4 spindle Henry & Wright.
4 spindle Kokomo.
5 spindle Detroit Semi-Automatic.
6 spindle No. ½ Avey.

EASTERN MACHINERY CO.

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6 spindle No. 1 Avey-Matic.
6 spindle No. 2 Foote-Burke.
6 spindle 21" Hoefer Gang.

LATHES

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No. 5 Center Drive Niles Car Wheel Lathe, m. d., with A.C. motors, used.
42" x 28" American Geared Head, m. d.
42" x 20" Putnam Geared Head, m. d.
36" x 29" Johnston, cone.
36" x 28" American Geared Head, m. d.
36" x 11" American, cone.
30" x 14" Lodge & Shipley, cone.
30" x 11" American, cone.
25" raised to 32" x 12" LeBlond, cone.
24" x 12" Schumacher-Boye, cone.
24" x 11" Chard, cone.
24" x 12" LeBlond, cone.
24" x 10" Greaves-Klusman, cone.
24" x 10" American, cone.
24" x 8" Hendey Yoke Head cone.
22" x 10" L. & S., Selective Head, cone.
20" x 12" Lodge & Shipley Patent Head.
20" x 10" LeBlond, cone.
20" x 10" Hendey Yoke Head cone.
20" x 10" Hendey Geared Head.
20" x 10" Boye & Emmes, cone.
20" x 6" Hendey Geared Head, m. d.
18" x 10" Lodge & Shipley Patent Head.
18" x 8" Hendey Yoke Head.
18" x 8" Greaves-Klusman, cone.
17" x 8" Sidney, cone.
16" x 14" Lodge & Shipley Selec. Head.
16" x 12" Prentice Geared Head.
16" x 6" Hendey Yoke Head.

TURRET LATHES

Gisholt Simplimatic, m. d.
2x24" Jones & Lamson Geared Head.
3x36" Jones & Lamson Geared Head.

2 spindle 3x36" Jones & Lamson Geared Head.
3 1/4x36" Cincinnati Acme Flat Turret Lathe, m. d.
3 1/4" Gridley Single Spindle Automatic.
14" Fay Automatic.
21", 24" Gisholt Turret.
No. 1, 4 Foster Turret.
No. 2, 4, 6, 8 Warner & Swasey Turret.
No. 2A, 3A Warner & Swasey Univ.
No. 2F Foster Fastermatic, m. d., like new.
No. 3 Foster Turret, m. d. in base.
No. 4, 7 Bardons & Oliver Turret.
No. 5A, 6A Potter & Johnston Auto.
No. 23, 24 New Britain Automatics.

MILLING MACHINES

No. 2 Cleveland Plain, s. p. d.
No. 2 Cincinnati Plain m. d. flanged spdl.
Nos. 3, 4 Cincinnati Plain, cone.
No. 3 Kempamith Plain, cone.
No. 2 H. D. LeBlond Plain, cone.
No. 13B Brown & Sharpe Pl., National Standard spindle.
No. 2 Brown & Sharpe Universal, cone.
No. 6 Becker Vertical, cone.
48" Cincinnati Pl. Automatic, spur dr.
48" Cincinnati Pl. Automatic, worm dr.
24" Cincinnati Duplex Automatic, m. d.
24" Cincinnati Duplex Automatic, belt.
24" Cincinnati Plain Automatic, m. d.
National Standard Spindle.
No. 33 Kempamith Mfg., s. p. d.
6x80" Pratt & Whitney Thread, m. d.
48" Oesterlein Tilted Offset, m. d., Timken Bearings, National Standard latest type.
Ingersoll Vertical, m. d., 40" rotary table.
C66A Newton 3 spindle Continuous Miller, 48" dia. table.

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Burr Cutter, Teer Wickwire.
Drill, Radial, 3¹/₂" Amer. Motor on Arm.
Drill, Radial, 3½" Morris.
Drill, Radial 3¹/₂" Western.
Drill, 6 spdl. Hammond Horiz. Opposed Type.
Drills, 2¹/₂" & 24" Cincinnati B. (28).
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Drill, Henry & W. 4 sp., No. 2 M.T.
Drill, 4-Spd. Leland-Gifford No. 2 M.T. 13" Overhang m. d.
Drill, 4-Spd. Allen No. 2 MT 15" Overhang m. d.
Drill, 4" Allen.
Filer, Die, No. 3 Theil, M. D.
Furnace, Homo Electric.
Grinder, 6x32 Norton, M. D.
Grinder, Bath Universal.
Grinders, No. 1 LeBlond T. & C.
Grinder, No. 70 Heald Duplex, Internal.
Grinder, No. 75 Heald Internal.
Grinder, No. 84 Gardner Dble. Disc. Opposed Type, Auto. Feed, M. D.
Grinders, No. 13 B. & S., M. D. (3)
Grinder, No. 2 B. & S. Universal.
Grinder, Pratt & Whitney Surface, M. D., B. B. spindle.
Grinder, No. 7½ Gardner Disc, M.D.
Grinder, No. 70 Heald Internal (3).
Grinder, No. 3 Abrasive M. D.
Grinder, Heim Centerless, M. D.
Grinder, No. 72 Hyd. Int. Heald, M. D. (3).
Grinder, No. 2 Cin. Univ.
Grinders, No. 12A and No. 20 Bryant Chucking.
Grinder, No. 1 Wilmarth & M. Surf.
Hammers, Nos. 3A & 4A Hi-Speed.
Keyseater, No. 1 Davis 1" cap.
Lathe, 18"x8' Monarch Gd. Hd. M.D. QCG. Taper att.
Lathes, 19"x12' LeBlond, Q. C.

Lathe, 16"x6' Hendey SPD.
Lathe, 18"x8' Hendey BMD.
Lathe, 30"x10' Reed Prentice M. D.
Lathe, Turret, No. 6 W. & S. Univ.
Lathes, Tur., No. 9 B & O Univ. (2).
Mills, No½-A K. & T. (2)
Mills, Rotary, No. 1 & 2 Craftsman.
Mills, No. 3 B. & S. Vert. M. D.
Mills, No. 2 B. & S. Vert. M. D.
Mills, Nos. 2B & 3B B. & S. SPD.
Mill, No. 3GH Hendey Univ.
Mills, 18" and 24" Cin. Prod.
Mill, 18" Cincinnati, Duplex.
Nibbler, Gray 34" throat by ¾" cap. power feed.
Oil Groover, Wicaco.
Pipe Threaders, 6" Williams M. D.
Pipe Threaders, 6" Outer, B. D.
Planer, 60"x60"x12' Niles Bement Pond, Box Table.
Press, No. 14 Toledo Hor. Gr., M.D.
Press, No. 204-A Bliss Adj. Bed.
Press, No. 4A Bliss, adj. bed.
Presses, Nos. P2, P3, P4 Ferracule M. D.
Press, No. DG53 Ferracule (3).
Press, No. 85 Cons. Adj. Bed.
Press, No. 21 Bliss Cons. Horning (4).
Press, Perkins, Cam Drawing.
Press, Cleveland, No. 44 Adj. Bed.
Saws, 6x6 & 9x9 Racine (2).
Separator, Oil, 1 bu. Curtis.
Shaper, 20" G. & E. SPD. MD.
Shaper, 20" Columbia Gear Box M.D.
Shaper-Planer, Coulter Openside 24" Stroke, M. D.
Shear, Slitting, Gray 34" thr., power feed.
Shear, 76" ¾" Bertsch M. D.
Shear, 8" 14 ga. Kutschend.
Shear, 10" ¼" United Eng & M. D.
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Wire Straightener, ½" - ¾" cap. (6).

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3 $\frac{1}{2}$, 4 $\frac{1}{2}$ Gridley sgl. spindle.
4 $\frac{1}{2}$ Cleveland "Model A"

Boring Machines (Hor.)

5" bar NBP. floor type.
5" bar Newton Portable.
No. 3 Hamilton, 4 $\frac{1}{2}$ " bar.
No. 3-A Universal, 3" bar.
No. 1 Cleveland, 2 $\frac{1}{2}$ " bar.

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24", 36", 42" Bullard, "New Era".
30", 32" and 60" King.
42", 48", 54" and 60" Colburn.

Drills (Ball Bearing)

1, 2, 3, 4, 6 Spindle L-G.
1, 2, 3, 4, 6 Spl. Henry & Wright.
4 spindle Demco, p. f.

Drills (Mfg.)

32" Cinn.-Bickford sliding head.
No. 2 Colburn, 1, 2, 3 and 4-spdl.
No. 210 1&3 spdl. Barnes.
No. 3-24" Defiance.
Nos. 314, 513 Baker.
No. 14 Natco Multiple.
No. 4 Bausch. mult.

Drills (Radial)

4" American plain.
4" Cincinnati-Bickford pl. radial.
5" American triple purpose.
5" American, full univ., m. d.
6" Cinn.-Bickford full univ.
6" American Triple purpose.

Gear Cutters

Nos. 2, 3 & 12 Barber-Colman.
No. 18 H. G. & E. hob.
No. 16 HS Gould & Eberhardt.
Nos. 6, 61, 62, 65, 615, 625 Fellows.
No. 4-36" & 48" B. & S.
96" Newton heavy duty.
12"x72" G. & E. rack cutter.

Grinders (Plain)

16"x48" Landis crankshaft.
Heim Centerless.
Nos. 10 and 12 B. & S.
6"x32" Norton.
10"x18", 24", 36" Norton.
10"x50", 72", 96" Norton.
10"x38", 52" Landis.
14"x36", 50", 72" Norton.
18"x96" Norton, m. d.
18"x144" Norton, m. d.
20"x168" Landis, m. d.

Grinders (Univ.)

No. 13 B. & S. cutter & tool.
No. 2 Brown & Sharpe.
No. 4-12"x66" Landis.

Grinders (Misc.)

No. 14 Landis, Internal.

No. 70 Heald, Internal
No. 10 Blanchard surface.
No. 16A Blanchard surface.
16" Arter rotary surface.
15"x17"x6", 8' Norton, o. s., surf.
No. 1 Gardner, hyd., face.

Lathes

14"x6" Lodge & Shipley.
16"x6" American.
16"x8" L. & S. T. A.
18"x10" Reed-Prentice grd. head.
20", 22", 24" x14" L. & S. sel. g. h.
22"-24" x12" L. & S.
24"-27" x12", L. & S. sel. g. h.
30"x11" American geared head.
36"x30" Rain-Larmon grd. hd.
54"x23" Johnson, T. G.
66"x21" Putnam t.g., m. d.

Millers (Plain and Universal)

Nos. 0, 1 $\frac{1}{2}$, 2, B. & S.
Nos. 2 & 3 Cinn. h. p., s. p. d.
Nos. 2-B, 3-B Milwaukee.
Nos. 2-B, 3-B, 4-B B. & S.
Nos. 4 Cinn. h. p., s. p. d.

Millers (Mfg.)

No. 5 48" Cincinnati hydromatic.
18" & 24" Cincinnati automatic.
No. 33-60" Kempsmith.
No. 4, & No. 8 Lees-Brad. thread.
36"x36"x12" Newton Duplex.
35"x44"x20" Ingersoll slab.

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No. 3-B Milwaukee.
No. 5-B Becker.
No. 6 Becker.
No. C-2 Becker.

Planers

24"x24"x12" Gray.
30"x30"x14" Gray, rev. m. d.
30"x30"x6", 18" Cincinnati.
36"x36"x8", 18" Cincinnati.
44"x36"x12" Gray.
36"x36"x14", 24" Cleveland o.s.
36"x36"x24" Gray.
42"x42"x30" N-B-P, Rev. m. d.
60"x48"x16" Gray max. service.
72"x60"x16" American.

Shapers

16" Walcott.
16" Stockbridge.
24" Gould & Eberhardt.

Turret Lathes

No. 4 Warner & Swasey, Univ.
No. 1-A Warner & Swasey.
No. 2-A Warner & Swasey.
No. 3 Cincinnati-Acme, a. c. b. f.
No. 3-A Warner & Swasey.
No. 4-A Warner & S., 7 $\frac{1}{2}$ H. S.
No. 4-L Gisholt, 9 $\frac{1}{2}$ h. s.

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RANSOM 26" DISC GRINDER, 15 HP 3 PH. 220-440 V. 60 CY. 900 RPM G. E. Motor A-1 \$190.00.

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 $4'' \times 1'' \times 1\frac{1}{4}''$ ea. \$4.50, $2\frac{1}{2}'' \times \frac{3}{4}'' \times 1\frac{1}{4}''$ ea. \$2.50. No. 9 B&S $1 - \frac{1}{8}$ " LH HS End Mills ea. \$3.50. List of other cutters and end mills upon request.
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Air compressors, 30' to 2000'.
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Drills, No. 4 Quiet turret.
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Gearcutter, No. 6 Fellowes gr. shaper.
Gearcutters, No 1&3 Adams hobbers.
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Grinders, 13x66 Landis universal.
Hammers, 500 & 25 lb. Little Giant.
Hammer, 200 lb. Bradley.
Hammer, steam 4000 to 250 lb.
Hammer, 80 Perfect.
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Lathes, 18"x8' L. & S. QCG cone.
Lathes, 18"x8' Le Blond QCG cone.
Lathes, 16"x10' Monarch QCG cone.
Lathes, turret, No. 3 & 7 universal
Bardons Oliver.

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Lathes, 26"x12 Flather, q. c. g.
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Lathes, 3 Gridley 24", Model F., 4 sp.
Miller, Pratt & Whitney spline.
Miller, No. 4 Brown & S., plain.
Miller, No. 3 Hendey, plain.
Miller, Waltham thread.
Miller, No. 2 Kempsmith, univ.
Millers, No. 1 U. S. hand.
Millers, Ingersoll, 27"x24"x10".
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Planer, 30x30x8 Cinn. 1 head.
Planer, 36x30x8 Cleveland open side.
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Presses, hydraulic up push 18" dia.
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Punches and shears, structural all
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Shears, 310 Niagara ring & circle 1 1/4"
Shears, 44" Bertsch sq., 16 ga.
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moulder.
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200 electric motors and generators.
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16¹ Niles-Bement-Pond Vertical.
10—16' Betts Extension Vertical.
96¹ N.-B.-Pond Vertical.
90¹ Pond Vertical.
84¹ Bullard Vertical.
84¹ Betts Vertical.
60¹ Colburn Vertical.
62¹ N.-B.-Pond Vertical.
53¹ N.-B.-Pond Vertical.
44¹ N.-B.-Pond Vertical.
36¹—44¹ Niles-Bement-Pond Vert.
36¹ Bullard New Era.
24¹ Bullard New Era.
7¹ Bar D and H Horizontal.
6¹ Bar Egan Lucas Horizontal.
No. 6 Barrett Horizontal.

LATHES

109¹ x 50' Niles Bement Pond.
96¹ x 50' Niles-Bement-Pond.
92¹ x 29' Niles Bement Pond.
36¹ x 26' Lodge & Shipley.
30¹ x 36' Bridgeford.
30¹ x 14' Lodge & Shipley.

RADIALS

6¹ Cincinnati-Bickford Plain.
5¹ Cincinnati-Bickford Plain.
5¹ American Triple Purpose Plain.
5¹ Niles Right Line Plain.
4¹ Cincinnati-Bickford Plain.

MILLERS

No. 4-B Brown & Sharpe Plain.
No. 4 Cincinnati Plain.
No. 3-B Milwaukee Plain.
No. 3 Cincinnati Plain.
No. 2 Cincinnati Plain.

PLANERS

96¹ x 96¹ x 40' N.-B.-Pond.
84¹ x 84¹ x 20' N.-B.-Pond.
84¹ x 60¹ x 14' N.-B.-Pond.
72¹ x 72¹ x 12' N.-B.-Pond.
56¹ x 56¹ x 12' N.-B.-Pond.
56¹ x 48¹ x 12' Cincinnati.
48¹ x 48¹ x 20' Detnick and Harvey.
48¹ x 48¹ x 10' Cincinnati.
42¹ x 42¹ x 20' Niles Bement-Pond.
36¹ x 36¹ x 14' Grav.
30¹ x 30¹ x 8' Cleveland Openside.

GRINDERS

14¹ Pratt & Whitney Vert. Surface.
No. 33 Abrasive Surface.
No. 20 Heald Rotary.
12¹ x 36' Landis Plain.
14¹ x 50' Norton Plain.
14¹ x 72¹ Norton Plain.
18¹ x 84¹ Landis Plain.
Nos. 2, 3, 4 B. & S. Universal.
No. 13 B. & S. Universal.
No. 1 LeBlond Universal.

MISCELLANEOUS

40¹ x 1" Southwark Bending Roll.
13¹ x 1¹<sub>2 N.-B.-P Bending Roll.
90¹ Niles-Bement-P. Wheel Lathe.</sub>

SHAPERS

40¹ Morton Draw Cut.
28¹ Columbia.
26¹ Cincinnati Traveling Head.
24¹ Gould & Eberhardt.
24¹ American.
16¹ Gould & Eberhardt.
6¹ Pratt & Whitney Vertical.

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42" Bullard, Power Rapid Traverse.
48" Colburn, P. R. T., M. D.
60" Bullard, P. R. T., M. D.
72" Bullard, Self Cont.

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2' American, S. P. D.
3' American Sensitive.
4 Spindle Kokomo, 12 $\frac{1}{2}$ " overhang.
4' and 6' Mueller, Gear Box (2).
5' American Tr. Grd.
6' American universal.
4 & 6 spindle Allen.

GRINDERS
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10"x36" Landis Plain (3).
12"x36" Landis Plain.
12"x52" Landis Self Cont.
No. 2 Landis Univ. 12"x36".
16"x48" Landis crankshaft.
16"x50" Norton Self Cont.
26" x 96" Landis Self Cont.
26" x 120" Landis Self Cont.
48" Badger face, Hyd. Feed.
No. 2 Diamond 36"x12"
16" Heald Rotary Surface.
No. 58, 60 and 65 Heald Cylinder.
No. 70 Heald Internal.
53" Bessey Vert. Spin. Disc.
14" P & W Surface M. D.
No. 2 B. & S. Surface M. D.
No. 33 Abrasive Surface (2).
No. 103 Rivet Internal.

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20"x8" American Cone.
24" x 10' and 12' American Cone.
24"x12" Putnam Q. C. G. Cone.
24"x12" American Grd. Hd. T. A.
24"x19" American L. C. G.
26"x10' Boye & Emmes QCG Cone.
28"x17" Chard, Grd. Hd.
30"x12" S & B Cone, T. A.
36"x16" Bridgeford AC M. D.
36"x26" L & S cone Q. C. G.
42"x18" New Haven, Cone.
42"x20" Bridgeford Grd. Hd.
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No. 2 Knight.

MILLERS, Plain
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No. 4G LeBlond Grd. Hd.
No. 3G Hendey Grd. Hd.
No. 2B Heavy, B. & S.
No. 3B Heavy B & S Geared Head.

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72"x80"x16" Detrich & H. open side.
48"x48"x10" D & H Open side.
42"x36"x12" & 24"x6" Cinci. M.
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24" Lynd Farquhar Open side.

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400 ton N.B.P. Hor. Hyd. Carwheel.

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No. 2B Gorton Internal, 7 $\frac{1}{2}$ ".
6" Peerless univ., shaping.
No. 16 Higley, cold, m. d.
No. 4B Cochrane & Bly.

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3/16	1/2	1 3/8	1.70	.85
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1/4	5/8	1 11/16	1.80	.90
5/16	1 1/16	1 3/4	1.90	.95
3/8	3/4	1 13/16	2.10	1.05
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7/32	1 1/8	2 1/8	7/32	1.44
1/4	1 1/4	2 1/4	1/4	1.44
5/16	1 3/8	2 3/8	5/16	1.52
3/8	1 1/2	2 3/4	3/8	1.68
7/16	1 3/4	3	7/16	1.84
1/2	1 7/8	3	1/2	2.00
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Miller, 1-M Cinn. vertical, s. p. d.
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Miller, Ingersoll 24x24x10 M.D. 1-hd. on rail 2-side hds.
Turret Lathe, Warner & Swasey No. 3-A.

Grinder, Besly No. 1 double disc, M. D.
Keyseater, Mitts & Merrill Nos. 0 and 3 with broaches.
Lathe, McCabe double spindle 26—48x12¹.
Lathe, Pratt & Whitney 1x18 automatic.
Press, Toledo No. 30 Bench.
Press, Bliss No. 61 Reducing.
Press, Bliss, No. 68 double action.
Press, Zeh & Hahnemann No. 8½ power percussion.
Press, American Can No. 5 Inc. F. W. T.
Press, Walsh No. 5½ Inc. F. W. T.
Press, Bliss-Styles No. 259 Toggle Joint Pendulum.
Punches, Kling No. 2 & No. 4.
Roll, Beloit No. 3-E—6¹ slip.
Roll, 10¹ power, cap. ¼" C. P.
Saw, Klemm No. 2 metal tilting.
Shear, Kent 4¹ power, cap. 10-ga.
Shear, Niagara No. 230 power, cap. 16-ga.
Shear, Pexto 36⁸ gap.
Shear, Badger, No. 27 splitting.
Shear, Quickwork rotary 60⁸, cap. 14 ga.
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Niagara 10" 10 ga. cap. motor driven Squaring shear.
Lathe, 18x8 Monarch, geared head, motor driven.
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Planer, 36"x36"x15' overside, 2 heads.
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16" Ohio Shaper.
6"x6" Acme Hack Saw.

9"x9" Peerless Hack Saw.
24"x10" Lodge & S. Lathe.
20"x10" Hendey Lathe.
10"x8" Prentice Lathe, Grd. Hd.
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Double disc grinders—all sizes.
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14" x 6' Lodge & Shipley q. c.
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30" x 14", 30" x 20" Niles S. B. grd cone.
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Drill, No. 1½ Avey, 3 spindle.
Drill, No. D-3 Colburn, h.d., 3" cap.
in steel.
Drill press, 4 spindle No. 2 Avey.
Drill, 3 spindle L. & G. power feed.
Drill, 5' American enclosed head.
Grinder, No. 10 Besly double disc.
Grinder, surface, No. 2 Reed.
Grinder, No. 3 Abrasive surface.
Grinder, No. 33 Abrasive surface,
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Hammer, 1200.lb. Bliss, board drop.
Lathe, 26"x12' Ryerson grd. hd. m.d.
Lathe, stub, 12" Sandstrand.
Miller, No. 2B K.&T. pl. complete.
Miller, No. 13-B B. & S.
Miller, No. 1 Kempsmith univ.
Miller, No. 2 Kemp. pl. maxi. m. d.
Planer, 56"x56x12' Gray.
Planer, Cleveland 48 x 48 x 12'
openside, factory rebuilt.
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AVEY BALL BEARING DRILLS—2 and 3 spindles.

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LATHES

11"x4' Shaffner Bench (new).
11"x5' Summit Floor Type (new).
10"x6' Sidney Lathe, floor type.
10"x5' Monarch, floor type.
12"x5' LeBlond.
12"x6' Monarch.
14"x6' Reed.
14"x6' LeBlond.
16"x8' Hamilton, quick change.

16"x8' South Bend.
16"x8' Monarch with taper att.
16"x5' Monarch, motor drive.
14"x8' Young.
14"x8' Monarch, 3 step, cone
double back.
20"x10' Bradford.
24"x24' Prentice.
24"x10' LeBlond extra heavy duty

SHAPERS

16" B. G. Queen City. (2)
20" & 21" Smith & Mills.

25" Smith & Mills.
14" Niles travelling head.

MILLING MACHINES

No. 1½ Valley City, plain.
No. 4 LeBlond plain.
No. 2 Brown & Sharpe, heavy.

24"x20"x8' Ingersoll.
No. 1 Kempsmith Universal.
No. 25 Becker plain.

MISCELLANEOUS

Planer, 36"x36"x14' Gray.
Planer, 42"x42"x10' Gray.
Planer, 36"x36"x12' American.

Press, No. 24 Toledo Cam Drawing
Press, No. 75, No. 2 o.b.i. Toledo.
Presses, New Federal & Robinson.

**THE
OSBORNE & SEXTON
MACHINERY COMPANY
COLUMBUS OHIO**

Boring Mills and Milling Machines:

- 1-26" Bullard with Side Head, Single Pulley Drive.
- 1-42" King, 2 Swivel Heads, Plain Table, Motor Drive.
- 1-42" Bullard, 2 Swivel Heads, 3 Jaw Chuck, Table, Motor Drive.
- 1-42" Bullard, 1 RH Tur. Head 1 LH Swivel Head, Plain Table.
- 1-50" Bullard, 2 Swivel Heads, Plain Table.
- 2-48" Colburn, 2 Swivel Heads, Plain Table, Motor Drive.
- 1-52" King, 2 Swivel Heads, Plain Table, Motor Drive.
- 1-52" Gisholt, 2 Swivel Heads, Plain Table, Motor Drive.
- 2-No. 3 Cincinnati, Rd. Overarm Plain Millers, Rpd. Trav., M. D.
- 1-No. 4 Cincinnati, Plain Miller, Rd. Overarm, RT., M. D.
- 1-No. 4S Cincinnati, Rd. Overarm, Plain Miller, RT., M. D.
- 1-No. 4B Heavy B. & S. Plain Miller, Motor Drive.
- 1-No. 5 Cincinnati Rd. Overarm Plain Miller, RT., M. D.
- 2-No. 5 Cincinnati, Rect. Arm, Dial Fds., RT., M. D.

WE CARRY A FULL STOCK OF USED MACHINE TOOLS

Your Inquiries Will Be Appreciated.

The Strong, Carlisle & Hammond Co.
1392 West Third St.
CLEVELAND, OHIO

2832 East Grand Blvd.
DETROIT, MICHIGAN

TURRET LATHE—No. 4 Warner & Swasey, 6 speed, Geared Head, Universal.
TURRET LATHE—No. 6 Warner & Swasey, Cone Drive.
TURRET LATHE—No. 2-A Cinc. Acme, Grd. Hd., m. d.
TURRET LATHE—48" Bullard Vert., 2 swivel hds., b. d.
PROFILER—No. 12 Two Spindle Pratt & Whitney, arr. m. d.
MILLER—18" Cincinnati Manufacturing, m. d. Like New.
THREAD MILLER—Hall Planetary, Arr. m. d.
PRESS—No. 14½ Toledo Horning, Arr. M. D., 9" stroke.
GRINDER—No. 14 Brown & Sharpe External, b. d.
GRINDER—Lees-Bradner Gear Tooth Grinder.
GRINDER—Norton Type A, 10"x24" Special Cam Grinder, m. d.

Complete setup of 15" Gleason Spiral Bevel Gear Cutting Equipment, consisting of 1—15" Rougher; 2—15" Finishers; 1—Lanper; 1—Tester; 1—Cutter Grinder. Price exceptionally low for quick sale.

JAMES W. GEORGE
3131 E. Jefferson Ave., Detroit, Michigan

OVER A QUARTER CENTURY OF LEADERSHIP

SPECIAL VALUES FROM CHICAGO'S LARGEST MOST COMPLETE STOCK OF REBUILT EQUIPMENT

A. C. GENERATORS

- 1—750 KVA. C. Wn. 600 RPM.
1—500 KVA. E. Mch. 514 RPM.
1—375 KVA. G. E. 225 RPM.
1—240 KVA G. E. 720 RPM.
1—165 KVA Wgse. 225 RPM.
(Many additional all capacities)

ENG. GENERATORS

- 1—225 KVA & 1—150 KVA. stm.
TRANSFORMERS

- 2—100 KVA Mal. 12M-460 v.
2—54KVA Kuhl. 440 110/220 dry.

M-G SETS

- All cap., 720 KW down.

Frequency Changers

- 1—90 K. W. 60/120 cv

TURBO GENERATORS

- 2—1250 KW condensing.
1—750 KW condensing.

Write for NEW FREE CATALOG containing thousands of Electrical Machinery Items—Motors, Welders, Platers, Compressors, Pumps, Turbines, etc.

A. C. MOTORS

- 1—1000 H.P. C. Whl. Syn. 600 RPM.
1—750 H.P. E. Mch. Syn. 514 RPM.
1—500 H.P. Al-Ch., 450 rpm. sl. ring.
3—200 H.P. slip ring 720 RPM.
1—200 H.P. Brk. s. rng. 900 RPM.
1—150 H.P. Al.Ch. aq.cg. 1200 RPM.
1—100 H.P. G. E. vert. 900 RPM.
(Many additional, down to 1/20 HP.)

D. C. MOTORS & GENERATORS

Large complete stock 115 & 230 volt.

SYNCH. CONDENSER

- 1—1250 KW G. F. 2340-3-60 3600 rpm.

PLATERS

- 1—4000 amp. 6/12 v. Burke.
1—3500 amp. 6/12 v. Bogue.

WELDERS

- 1—500 amp. Westinghouse.
2—300 amp. and 2—200 amp. Lincoln.

CHICAGO ELECTRIC CO.

1340 W. 22nd ST.,

CHICAGO

60^o Cincinnati.
48^o Colburn.

BORING MILLS

42^o Gisholt.
42^o Bullard.

MILLING MACHINES

Nos. 5, 4, 3, 2 Cincinnati, Plain.
No. 3-B Brown & Sharpe Plain.
No. 3 Kempsmith Plain.
No. 2 LeBlond Universal.

No. 3-B Milwaukee Vertical,
Motor in base, P. R. T.
No. 2, 4 Cincinnati vertical.
No. 15 Garvin Vertical.

RADIAL DRILLS

8^o Cincinnati-Bickford Enclosed Head, M. D.
6^o American Triple Purpose Enclosed Head, Motor on Arm.

LATHES

42^ox27^l American 16 speed G. H. 32^ox17^l Houston Stanwood & G.
34^ox12^l Lodge & Shipley. 20^ox8^l American.

MISCELLANEOUS

Drill, No. D4 Colburn Heavy Duty; 36^o Cincinnati-Bickford Tapping.
Grinders, No. 16 Blanchard Direct M. D., 25 H. P. Motor.
Grinder, No. 1 and No. 13 Brown & Sharpe Universal.
Grinder, No. 65 and No. 70 Heald Internal.
Grinders, No. 3 Bryant internal; No. 3 Wilmuth & Mormon Surface.
Press, 50 Ton Lucas Power Forcing.
Shear, No. 2 Hilles and Jones Squaring, 28^o gap, 74^ox3/4^o.
Slotter, 18^o Dill, Motor Drive.
Turret Lathes, 26^o Libby 7 1/2^o spindle—26^o Libby 4 1/2^o spindle.
Turret Lathes, 24^o Gisholt 6 1/4^o spindle; No. 5 Foster.
Turret Lathe, 3^ox36^l J. & L.—Bar and Chucking.

SUN MACHINERY COMPANY, INC.
36 Van Vechten St., NEWARK, N.J.

WRITE US—WE CAN LOCATE IT

Automatics, Nos. 60 & 6 B. & S.
Bolt Threader, 19^l Landis Geared
Head, M. D. with lead screw.
Broach, No. 3 Type XA Oilgear
Hydraulic.
Drills, 4 spdl., ball bearing Avey
& L. & G.; 20^o, 25^o and 28^o Barnes
b. g., p. f.; 24^o Cin. s. h. b. g., t.a.
Grinders, 26^o Badgerdisc, ball bearing;
No. 52 Greenfield Hydrol
Internal; No. 20 Heald Rotary;

S. & B. q. c. g. taper att.
Millers, No. 1 1/2 & 2 B. & S. univ.,
No. 2 Kempsmith, univ.; No. 2
Cinc., all grd., m. d.; No. 35 Ohio,
univ.; No. 4-B Becker vert.
Nibbler, No. 1-A Campbell.
Planer, 36^ox10' Gray, 2 heads.
Punch presses, o. b. i. No. 3
Toledo; No. 3 Robinson; No. 01
V. & O.
Punch presses, Nos. 1 Bliss cam

SPECIALS

**No. 4 CINCINNATI VERTICAL MACHINE, S. P. D.; No. 14
COCHRANE & BLY COMB. Mill and Shaper, m. d.; 12^o and 14^o
HENDEY LATHES, T. A. and Collets.**

No. 280 Heald rotary, 16^o ck.; 84^o
Diamond Face Grinder; 12^o P. & W.
Surface; No. 3 W. & M. Surface.
Hacksaws, No. 8 Marvel, M. D.;
6x8 Peerless Shaping, M. D.
Lathes, 14^o to 36^o Lodge & Shipley,
q. c. g.; 18^ox10' Hendey, taper att.;
16^ox10' Seneca Falls, q. c. g.; 19^ox8'
LeBlond q. c. g. taper att.; 16^ox8'
Monarch q. c. g.; 20^ox8' Monarch,
q. c. g.; 20^ox8' American q. c. g.;
20^ox10' Prentiss grd. head; 24^ox12'

draw; No. 74^o Bliss S. S.; No. 4A
Bliss Horn; No. 76A Stollable.crk.
Screw machine., No. 6 W. & S.
Shears, 10' Bertsch, 10 ga., m. d.;
30' Bertsch corrugating; No. 05
Niagara ring & circle, m. d.
Spinning Lathes, 22^o—44^o Gap Ball
Bearing.
Welders, arc, 200 Amp. USL.
Welders, butt, 15 K. W. Toledo.
Welders, spot, new 5 K. W. Dyer;
13 KVA Taylor; 25 K.W. Toledo.

Send For Our New Stock List.

VICTOR MACHINERY CO., 130-132 S. Clinton St.,
CHICAGO, ILLINOIS

WHY LOOK FURTHER

ENGINE LATHES

- 12"x6' Prentice.
- 14"x6' LeBlond.
- 14"x6' Hendey.
- 14"x8' Hendey.
- 14"x6' Bradford.
- 14"x8' Reed-Prentice.
- 14"x6' Prentice.
- 16"x8' Hendey.
- 16"x9' Chard.
- 16"x8' American.
- 16"x8' Murch.
- 16"x8' LeBlond.
- 16"x6' Pratt & Whitney.
- 18"x8' LeBlond.
- 18"x8' Lodge & Shipley.
- 18"x8' Prentice.
- 18"x8' Schumacher & Bowes.
- 20"x14' Hendey.
- 20"x10' Greaves Klemman.
- 20"x8' LeBlond.
- 22"x8' Lodge & Shipley.
- 24"x10' Prentice.
- 24"x10' American.
- 24"x16' Sidney "Tritrol".
- 25"x10' Ryerson-Conradson.
- 26"x12' Wickes.
- 26"x16' Bridgeford.
- 26"x20' Bridgeford.
- 27"x16' LeBlond.
- 27"x16' Bridgeford.
- 30"x13' Wickes.
- 30"x11' H-S-G.
- 30"x26' Lodge & Shipley.
- 36"x22' Bridgeford.
- 36"x32' Bridgeford.
- 36"x38' Bridgeford.
- 36"x15' Lodge & Shipley.
- 42"x24' Putnam.
- 56"x20' Lodge & Shipley.
- 56"x34' Pond.

TURRET LATHES

- No. 4-No. 7 Bardons & Oliver.
- No. 4-No. 6 Woods Tilted.
- Nos. 1A, 2, 2A, 3A, 4, 6 W. & S.
- No. 1B, No. 2B, No. 5, No. 7 Foster.
- 18"-26" Libby.
- No. 4 Gisholt.
- Jones & Lamson, double spindle.
- 2 1/4"x26"-3 1/4"x36" Acme.
- 2"x24" Jones and Lamson.

PRODUCTION LATHES

- 8"-12"-15" Sundstrand Stub.
- Nos. 6-9-12 LeBlond Multi-Cut.
- Nos. 1F-3F Foster Fastermatic.
- 9"x12"-9"x20" Porter Cable.
- Model R Lo Swing.
- 3 1/2"x36"-3 1/2"x60"-3 1/2"x84" Lo Swing.
- 4"x36" Lo Swing.
- 7"x60"-8"x60" Lo Swing.
- 30" Gisholt Simplimatic.
- 14"x19"-14"x33" Fay Auto.
- Nos. 4D, 5A, 6A, 6C Potter & J.
- No. 3 Lodge & Shipley Duo-Matic.
- 14"x5' LeBlond.
- 17"x6"-17"x8' LeBlond.
- 17"x10' LeBlond.
- 19"x8' LeBlond.
- 20"x8' LeBlond.
- 21"x8"-21"x12" LeBlond.
- 20"x6"-20"x7' 6" Wickes.
- 20"x10' Wickes.
- 20"x6' Sebastian.

MILLERS

- Plain-Univ.-Vert.)**
- 1Y-2B-No. 4-No. 4B-No. 5B
- Brown & Sharpe.
- Nos. 2-3-3S-4 Cincinnati.
- Nos. 1A-2A-2B-3-3B Kearney & Trecker.
- No. 2-No. 4 Kempsmith Maximill.
- No. 3-No. 3H LeBlond.
- No. 3 Rockford.
- No. 2 Ryerson-Conradson.
- No. 2 Cincinnati Univ.
- No. 3AU Marvin Univ.
- No. 4B Kearney & Trecker Univ.
- No. 4 Ryerson-Conradson Univ.
- No. 5-No. 5C-No. 6 Becker vert.
- No. 1M-No. 5 Cincinnati vert.
- No. 2 Brown & Sharpe vert.
- No. 4B Kearney & Trecker vert.
- Taylor & Fann vert.
- D-1 Becker vert.
- Billings & Spencer vert.
- No. 2-No. 3 Pratt & Whitney vert.
- E-4 Keller Proton.
- 12"-18" Cincinnati.
- No. 1A Kearney & Trecker.
- No. 32-No. 33 Kempsmith.
- No. 3 Sundstrand Rigidmill.
- 18"-24"-48" Cincinnati Duplex.

This is a partial list. Many others in stock.
Structural and Sheet Metal Tools—Gear

LOUIS E. EMERMAN & CO.

H E R ? WE'VE GOT IT—

18"-24"-48" Cincinnati.

3-36"-4-36"-4-48" Cincinnati dup.
Hyromatic.

No. 13B Brown & Sharpe.

HIGH SPEED DRILLS

(1 to 4 spindles)

No. 1½-No. 1½-No. 2-No. 3 Avey.
No. 2-No. 3 Avey-Matic.

14"-16" Allen.

14" Canedy Otto.

14"-16" Demco.

16" Detroit.

18"-2B-3B-4B Edlund.

13"-16" Fosdick.

16" Gordon.

No. 3 Henry & Wright.

6" Langelier.

No. 1-No. 2-No. 3 Leland Gifford.

No. 2 Pierle.

16"-24" Sipp.

12"-14"-16" Taylor & Fenn.

UPRIGHT DRILLS

28"-40" Aurora.

20"-22"-26"-34"-42" Barnes.

21"-24"-28"- (25-36") Cincinnati.

20" Canedy Otto.

14" Excelsior.

21" Fosdick.

26"-32" Hoefer.

26" Hamilton.

22" Milwaukee.

28" Rockford.

21" Superior.

28" Snyder.

21"-25" Weigel.

RADIAL DRILLS

2½" Ayer Bench Type.

3"-4"-5"-6" American.

3" Carlton.

2½"-5"-6" Cincinnati.

4" Hammond Mod. B.

4" Fosdick.

3½" Morris.

5" Prentice.

5"-8" Peterson.

4"-6" Verson.

HEAVY DUTY DRILLS

Nos. 121-716-217-310 Baker.

Nos. 314-315-322-513 Baker.

20"-22"-24" Barnes Camel Back.

No. 2-No. 4 Colburn Mfg.

D-2-D-4-D-5 Colburn.

20"-21"-24" Cincinnati Prod.

24" Defiance.

No. 1 Hoosier.

No. 23-24-25 Foote Burt.

No. 1 Minster.

No. 9 Natco-Minster.

No. 12 Minster.

GANG DRILLS

2-3 and 4-spindle No. 2 Colburn.

2-spindle No. 6 Colburn.

2-spindle 28" Cincinnati.

4-spindle 24" Cincinnati.

6-spindle 42" Cincinnati.

2-spindle 22½" Barnes.

6-spindle No. 242 Barnes.

RAM DRILLS

2-3 spindle No. 1 Foote-Burt.

4-spindle No. 1 Foote-Burt.

2-4 spindle No. 4½ Foote-Burt.

spindle No. 13D Moline.

8-spindle No. 64D Moline.

8-spindle Moline Hole Hog.

MULTIPLE DRILLS

Nos. 1-2-3-13-14-16-C5-C12

C13-13-B12C-No. 30 Natco.

No. 19HC-No. 27HC Fox Hyd.

No. 15-No. 22C-D-25 Fox.

No.—No. 3-No. 4-No. 36 Baush.

Boley.

GRINDERS

No. 16-No. 16A Blanchard.

No. 2 Brown & Sharpe.

No. 20-No. 22-No. 255 Heald.

No. 4 Diamond.

No. 5 Abrasive.

14" Model B Pratt & Whitney.

8"-14" Pratt & Whitney.

84" Diamond.

No. 1 Gardner.

No. 78 Wilmath & Mormon.

No. 2-No. 3 Cincinnati centerless.

No. 10-No. 12-No. 14 Brown & S.

8x30-6x20-6x30 Landis Hyd.

8x18-8x36 Cincinnati Saddle Type

10x18-10x36 Norton BA.

12x18 Cincinnati Plunge Cut.

6x18-10x24-10x36-12x52-12x72

Landis.

10x36 Landis Camshaft.

No. 132 Arter.

6x32-10x50-14x50-14x72-14x36

Norton.

in stock. Also a very large stock of presses,
machines and Miscellaneous others.

761 Elston Ave., Chicago, Ill.

SELECTIONS FROM

AUTOMATICS

14" Fay, late type.
Nos. 454 & 654 New Britain.
Nos. 3A & 6A Potter & Johnston.
1" & 2" Cleveland, Model A.
2" Cleveland, Model B.
1" Cleveland, Mod. M. 4 spindle.
1" Cleveland, Mod. J, double end.
1", 14", 18 & 34" Gridley.
10" Bullard Continumatic.
1", 18", 2" & 24" National Acme.
Nos. 24 & 33 New Britain chucking.
1" & 18" New Britain bar.
1", No. 19 Brown & Sharpe.

BROACHES

No. 3 Oilgear hydraulic.
15 ton Oilgear vert. hydraulic.
10 ton Metalwood vert. hydraulic.
Nos. 0, 2, 3 & 4 Lapointe.
Nos. 18 & 3 American rack.
2 ton American vertical.

COMPRESSORS

700' Sullivan angle compound.
550' National type 3VD.
446' Bury 2 stage.
355' Ingersoll Rand.
265' Worthington.
245' Ingersoll Rand.
136' Ingersoll Rand.
106' Chicago Pneumatic.
92' Ingersoll Rand.
67' Chicago Pneumatic.
46' Gardner vertical.
21' Ingersoll Rand vertical.

DRILLS

Nos. 216, 217, 315, 321 Baker.
1, 2, 3 & 4 spdl. Colburn No. 2 Mig.
2" Morris radial.
3" Dresses radial.
4" Mueller radial.
6' NBP univ. radial.
34", 4", 5", 6" and 8" Western radial.
21", 24", 28" Cincinnati.
400 spindles sensitive. All makes.
Nos. 6D, 11D & 16D Moline.
No. 17 Foote Burt rail.
2 and 6 spdl. P & W deep hole.
Nos. 11, 12, 13, 14, 30 Natco mult.
8 spdl. Detroit automatic.

FORGING EQUIPMENT

No. 51 Nazel air hammer.
Nos. 23 & 25 W. & W. bulldozers.
14" Acme upsetter.
1", 14", 4", 5" Ajax upsetters.
No. 3 W. F. cold header.
No. 1 Ajax forging rolls.

GEAR CUTTERS

Nos. 18H and 24H G. & E. hoppers.
Nos. 1 and 5A Lees Bradner.

No. 12 Barber Colman.
Nos. 6 & 715 Fellows.
11" Gleason bevel.
Nos. 3 & 4 Brown & Sharpe auto.
36" Newark automatic.
28" G & E. auto. spur & bevel.
No. 2 Bilton automatic.
Lipe 2 spdl. chamferer.
15" Gleason quenching press.

GRINDERS

No. 2 Cincinnati centerless.
Nos. 70, 72, 72A3 & 75 Heald.
No. 12 Bryant internal.
26" No. 16 Blanchard.
12" Arter rotary surface.
12" x 24" & 16" x 48" Diamond surf.
No. 2 Wilmarth & Mormon surface.
30" x 72" Springfield surface.
6" x 18" to 16" x 53" Landis.
6" x 32" to 14" x 72" Norton.
12" x 24" & 12" x 60" Modern.
12" x 18" & 12" x 36" Cincinnati.
10" x 30" Webster & Perks univ.
No. 2 Bath universal.
No. 4 Brown & Sharpe univ.
20", 24" & 30" Gardner disc.
Nos. 220 & 221 Badger disc.
30" Ransom 7½ H P elec. snagger.
16" x 48" Landis crank.
16" x 32" Norton crank.
10" x 24" & 10" x 36" Norton cam.
30" x 84" Diamond face.
8" Arter auto. piston ring.

ENGINE LATHES

10" x 5' Pratt & Whitney toolroom.
14" x 6' Monarch.
14" x 6' American geared head.
16" x 6' Monarch.
16" x 8' Walcott Taper & relieving.
16" x 8' & 16" x 10' Lodge & S. grd. hd.
18" x 8' Boye & Ennes.
20" x 8' Monarch.
21" x 18" Le Blond heavy duty.
22" x 10' Davis.
24" x 12' Lodge & Shipley.
28" x 11' Wickes.
27" x 12' Schumacher Boye.

TURRET LATHES

Nos. 4, 6 & 3A Warner Swasey.
Nos. 3 & 4 Foster.
No. 4 Bardons & Oliver.
21" & 24" Gisholt.
18" Libby.
24" & 3" Jones & Lamson.
2 spdl. Jones & Lamson.
24" Greenlee.
14" Cincinnati Acme.
1" Millholland.
24" Bullard vertical.

MILES MACHINERY CO.,

OUR LARGE STOCK

MFG. LATHES

- 8" x 108" Fitchburg Lo Swing.
- 8" Sundstrand Stub.
- 9" Sundstrand Mfg.
- 11" x 6" & 11" x 8" Leblond Mfg.
- 17" x 6" & 17" x 8" Leblond Mfg.
- Nos. 9 & 12 Leblond Multi-Cut.
- 20" x 8" Wickes Mfg.
- 25" x 11" Wickes crankshaft.
- 13" x 8" Automatic threading.

BORING MILLS

- 21" Bullard, side head.
- 30" Bullard, single turret.
- 34" Colburn, single turret.
- 36" Niles car wheel.
- 42" Detrick & Harvey.
- 60" Gisholt.
- 100" Betts.
- 25" Cleveland horizontal.
- 3" Binsen horizontal.

PLAIN MILLERS

- Nos. 2, 3 & 4 Cincinnati.
- Nos. 12, 2 hvy., 3B & 4B B. & S.
- No. 4 Hendey.
- No. 4 Le Blond.
- No. 3 Kempsmith.
- No. 2 Rockford.

MILLERS UNIV. & VERT.

- No. 1½ Rockford.
- No. 2 Cincinnati.
- No. 2 & 3A heavy Brown & S.
- No. 2 B. & S. vertical.
- No. 6 Becker vertical.

MILLERS PROD.

- 18" Cincinnati plain Mfg.
- 18", 24" & 48" Cincinnati automatic.
- 24" & 48" Cincinnati duplex.
- No. 1 Davis & Thompson drum.
- 24" & 48" Newton rotary.
- 48" x 48" x 8" Beaman & Smith.
- 28", 37" & 42" Briggs.
- 48" Ohio tilted offset.
- Nos. 1 & 2 Kent Owens hand.
- Kent Owens semi-automatic.

PLANERS

- 24" x 24" x 24" Cincinnati crank.
- 24" x 24" x 8" Liberty openside.
- 30" x 30" x 12" Cleveland openside.
- 32" x 32" x 12" Niles.
- 36" x 36" x 8" Gray.
- 36" x 36" x 10" Cincinnati.
- 36" x 36" x 12" Gray.
- 36" x 36" x 16" Cleveland.
- 48" x 36" x 10" Liberty.

PRESSES

- No. 19 Bliss OBI.
- No. 75 Toledo geared.

PARTIAL LIST ONLY

- No. 76 Fremont geared.
- Nos. 55, 56, 56½ Toledo.
- No. 74½ Bliss.
- Nos. 64 & 65 Consolidated.
- No. 62 Michigan.
- No. 7 Rockford.
- No. 94 Consolidated.
- Nos. PG4 & PG5 Ferracute.
- No. 25½ Consolidated horn.
- 600 ton Cleveland coining.
- Nos. 1½ B & 5A Bliss Toggle.
- No. 266 Consolidated cam drawing.
- No. DDG54 Ferracute cam drawing.
- No. 2 Standard screw.
- No. 7 Z. & H. Percussion.

PUNCHES

- 12" tht., 1½" x 1" Cleveland horiz.
- 12" tht., 1½" x 1" Long & Alstatter.
- 24" tht., 1½" x 1" Ryerson Kling.
- 71" French gang punch.

RIVETERS

- 20 & 50 ton Ailen pneumatic.
- 20 ton Hanna pneumatic.
- Nos. 1½ B, 2A, 3A, 4A & 5A High Speed Hammer, type.
- Nos. 101 & 120 Grant spinners.

SHAPERS

- 7" Rhodes.
- 10" McMahon.
- 16" Cincinnati.
- 16" Ohio.
- 24" Gould & Eberhardt.
- 24" Potter & Johnston.

SHEET METAL

- 48" McKay roller leveler.
- 4½" x 16" Niagara shear.
- 10" x 16 ga. Bertach shear.
- No. 1 Gray Sheet Metal cutter.
- 30" x 14 ga. Pettingell rotary shear.
- No. 3 RH Magee wirer.
- 6" tht., 3/16" Campbell nibbler.
- 12" tht., 8" Campbell nibbler.

THREADERS

- 1" Acme 2 spindle.
- 1" Webster & Perks 2 spdl.
- 1" 1½" & 2" Landis 2 spdl.
- 1" H. & G.
- 1" Geometric.
- 2" & 3" Acme.

WELDERS

- 400 amp. Lincoln arc.
- 35 & 45 KW Federal Butt.
- 10 KW Thompson spot.
- 18 KVA A. E. F. auto., spot.
- 20 KW Federal spot.
- 47 KVA Winfield spot.
- 100 KVA Thompson spot.

2000 TOOLS IN STOCK.

SAGINAW, MICHIGAN

LATHES

McCabe 50⁸-27⁸ Dbl. Spdl. DC MD
American 30⁸x18⁸ Icg. lathe tap.att.bd.
Schum. & B. 26⁸x16⁸ g.h.; qcg.; arr. md.
Reed 24⁸x12⁸ I.c.g.; s.b.g.; cone dr.
Pond 26⁸x10⁸ I.c.g.; s.b.g.; cone dr.
Schm. & B. 24⁸x10⁸ qcg.; cone drive.
LeBlond 19⁸x10⁸ hd. qcg.; belt drive.
LeBlond 18⁸x8⁸ I.c.g.; d.e. mtr. driven.
LeBlond 17⁸x6⁸ Plain Turning; bd.
LeBlond 17⁸x6⁸ Mfg. Type; belt dr.
American 16⁸x8⁸ Icg; lathe; cone drive.
Bradford 16⁸x8⁸ hd. q.c.g.; cone dr.
Chard 16⁸x8⁸; 60⁸ centers cone drive.
Champion 14⁸x6⁸ I.c.g.; belted cone dr.
Willard 13⁸x6⁸ Semi-qcg, collets.
LeBlond No. 9 Multi-cut; air chkd.; md.
Streit 24⁸ Pulley lathe; cone dr.
Ideal 7⁸x28⁸ Self-Con't. bench lathe.
Blount 11⁸x4⁸ Speed lathe; bd.

SHAPERS

26⁸ Walcott Plain Crank; belt drive.
24⁸ Cincinnati, b. g., h. d. cone drive.
22⁸ Ohio, b. g., cone drive.

MISCELLANEOUS

(2) 4½⁸ Gridley Auto. Scr. Mach. bd.
(2) 3½⁸ Gridley Auto. Scr. Mach. b.d.
2½⁸ Gridley Auto. Scr. Mach. b. d.
Bertach 10⁸x10ga. Press Brake, m. d.
(4) B & S No. 3 26⁸ gear cutters; b.d.
Fosdick 6⁸ encl. hd. radial; mtr-on-arm;
Fosdick 5⁸ box. col. radial; spd. thru gr.
Drees 5⁸ rd. col. radial; arr. SP or MD.
Drees 5⁸ pl. radial; arr. AC or DC.
Mueller 4⁸ Plain Radial; spd gear box.
Barnes 3-spin. 22½⁸ drill; all PF; BD.
Rockford 3-spin. 22½⁸ drill all PF; BD

**J. M. Robinson ¼"x12'6" heavy duty press
brake; double geared; double crank; A-type
cast iron end frames; 8½" diameter crank-
shaft; complete with 25-HP Westinghouse
DC driving motor and control. Condition
excellent!**

BORING MILLS

3⁸ bar Rochester horizontal; sp or m.d.
3⁸ bar Fosdick horizontal; spd or m.d.
4⁸ bar Fosdick No. 2-A Floortype ed.
Niles 72⁸ Vertical bor. mill; 2 hds.
King 42⁸ Vertical bor. mill; 2 hds. md.
Rockford No. 1½ pl. milling mach. cd.

MILLING MACHINES

Cincinnati No. 4, HD plain.; cone dr.
Cincinnati No. 3 Universal; cone drive.
LeBlond No. 3-HD Plain; 3-step c.d.
Brown & S. No. 12 Plain Cone Drive.
Garvin No. 12 plain Miller; c. d.
Becker No. 4B vertical; rot table; bd.

PLANERS

60⁸x60⁸x14⁸ Cincinnati; 2 hds.; b. d.
55⁸x55⁸x30⁸ Betts; 2 hds.; d. c. m. d.
48⁸x36⁸x10⁸ Gray; 2 hds.; d.c. m. d.
36⁸x36⁸x10⁸ Gray; 2 hds.; d.c. m. d.

Foot-Burt 4-spin. HD; power fd. bd.
Mueller 4⁸ rd. Column Radial; sp or m.d.
Cinci-Bickford 3⁸ radial drill; arr. m. d.
Moline 8-spin. hole hog type drill; spd.
Ohio No. 3 cutter & tool grinder; b. d.
Landis 20x96⁸ pl. Cyl. grinder. b. d.
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Heald No. 72 Hydraulic grinder b. d.
B & S 14⁸x72⁸ Plain Cyl.; b. d.
Atkins No. 3 metal band saw; b. d.
Coch-Bly No. 5 metal cutting saw; spd
Gardner No. 24-53⁸ bb disc grinder; md
Gardner No. 6 bb disc(20")grinder; bd
LeBlond No. 1 cut. & tool grinder; bd.
Landis No. 1½ universal grinder; b. d.
Foot-Burt No. 25 h. d.; drill; spd.
Foot-Burt 4-spindle adj. rail; b. d.
Avey 6-sp. Sensitive b.d.; belt drive.
Amer. 28⁸ BG HD shaper; m. d.; late.
(2) 36⁸x36⁸x12⁸ Chandler hd pl; BD

THE E. A. KINSEY CO.

333 West Fourth St.,

Est. 1886

Cincinnati, O.

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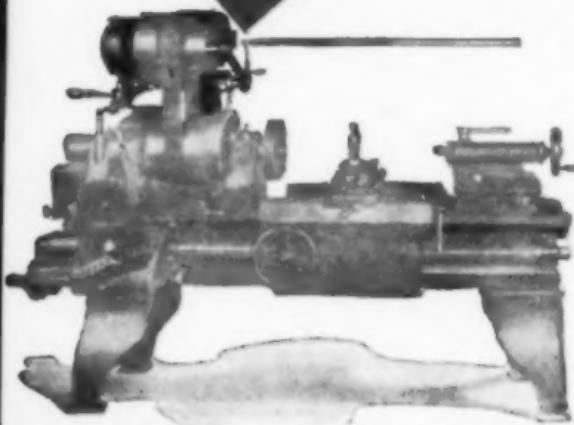
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